UGUST 21, 1961
Volume 50, No. 17

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OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

AMERICAN DYESTUFF REPORTER

TEXTILE WET-PROCESSING

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earns top billing!

Only stamina, energy and ability make the big time season after season. Rave notices greet WICAFIX HC as the copper-free, cationic dye fixative for directs. WICAFIX HC produces washfastness, ends migration, beefs-up non crocking, excels as after treatment, works well in resin bath. WICAFIX HC!

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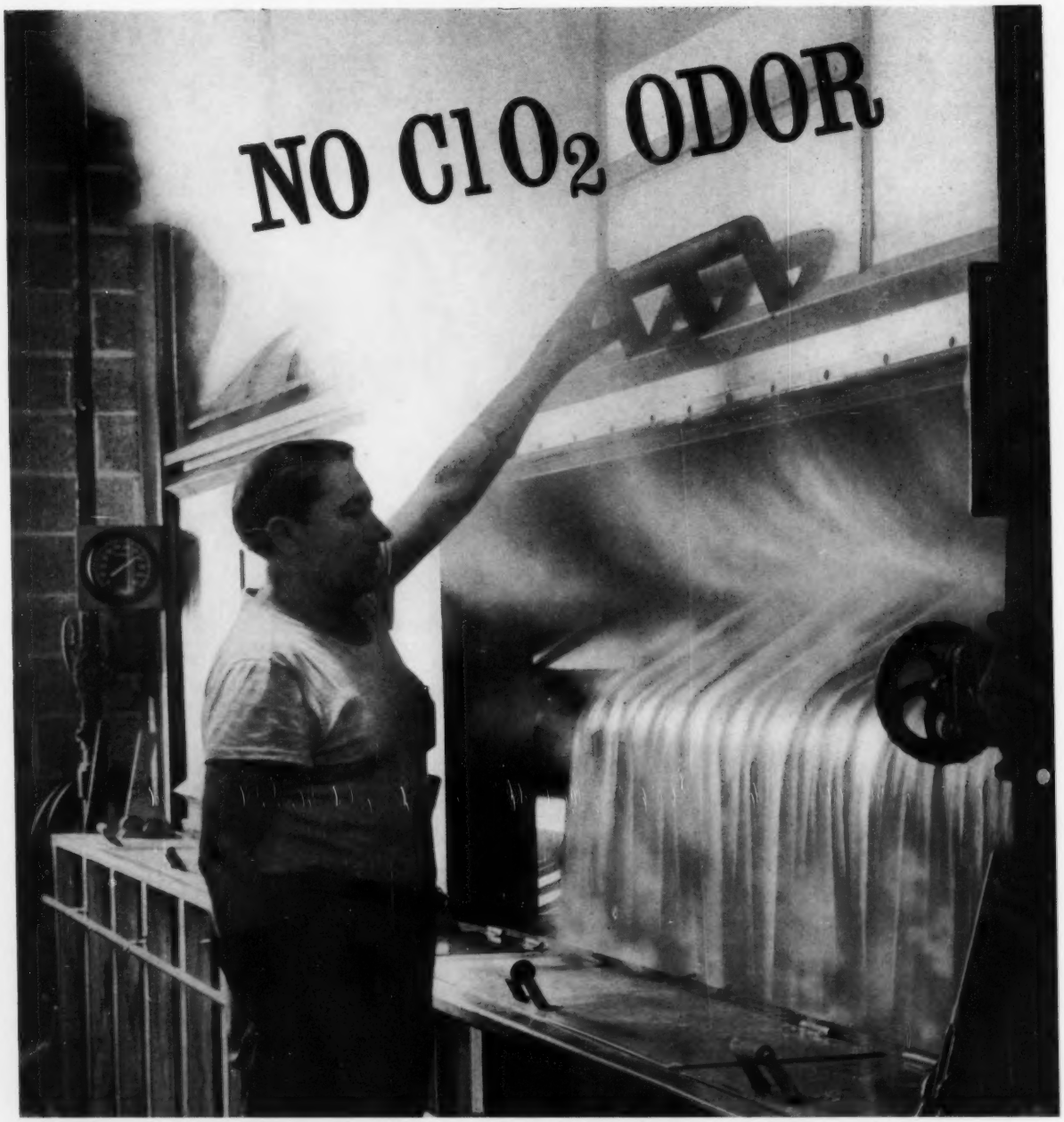

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Capture the spirit of the season with all your woolen goods . . . use AMACID and CHROMAVEN DYES. Available in a complete range of lively hues, Koppers select dyes are fast to sunlight, washing, perspiration and dry cleaning. You'll find, too, that these dyes are easily applied, and that they meet specific color demands for every type of wool dyeing—yarn or piece goods. So specify AMACID and CHROMAVEN DYES and get the color treatment you want . . . prize woolens dyed to stay vibrant.

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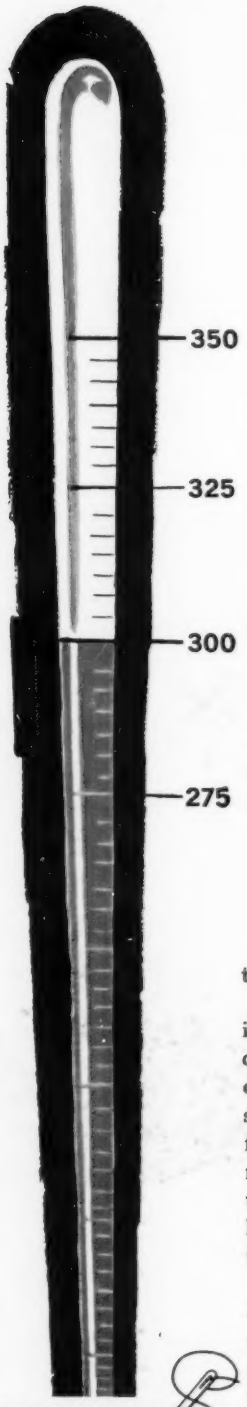
VMA 6663

B.F.Goodrich

New Geon vinyl resin cools down plastisols



Geon 135

CUTS COSTS OF CASTING, DIPPING, COATING, MOLDING. New Geon 135 is a vinyl copolymer that makes a plastisol which fuses at 300 degrees F . . . 50 degrees lower than plastisols based on other resins. Faster production or lower cost of oven operation result.

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These properties of Geon 135 make it ideal for rotational molding, slush molding, dip molding, stencil printing on calendered or extruded vinyl sheeting, vinyl foam, sponge, and as a tie-coat for lamination of film to fabric. Low fusion temperatures make Geon 135 especially useful for plastisols used to apply spread coatings to heat-sensitive materials such as Dacron, Orlon and polypropylene.

To get more information on how you can cut costs with Geon 135, write Department PG-9, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

PRODUCTS FOR TEXTILE IMPROVEMENT

B.F.Goodrich Chemical

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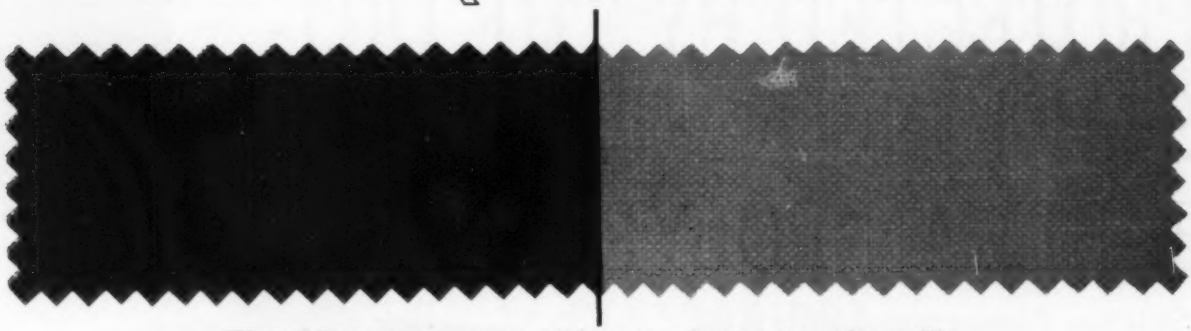
NEW

STRIPPING ASSISTANT FOR VAT DYES HIGHLY EFFECTIVE ON ANTHRAQUINONE TYPE!



The Algepons are well known in the textile mills, where they have been used successfully for years.

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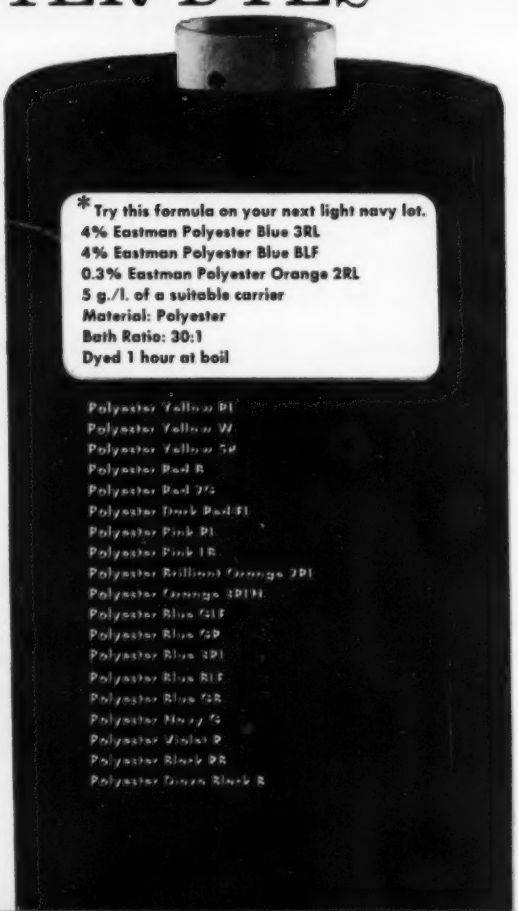

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Including since 1921, the official Proceedings of the American Association of Textile Chemists and Colorists

AMERICAN DYESTUFF REPORTER

TEXTILE WET PROCESSING EXCLUSIVELY

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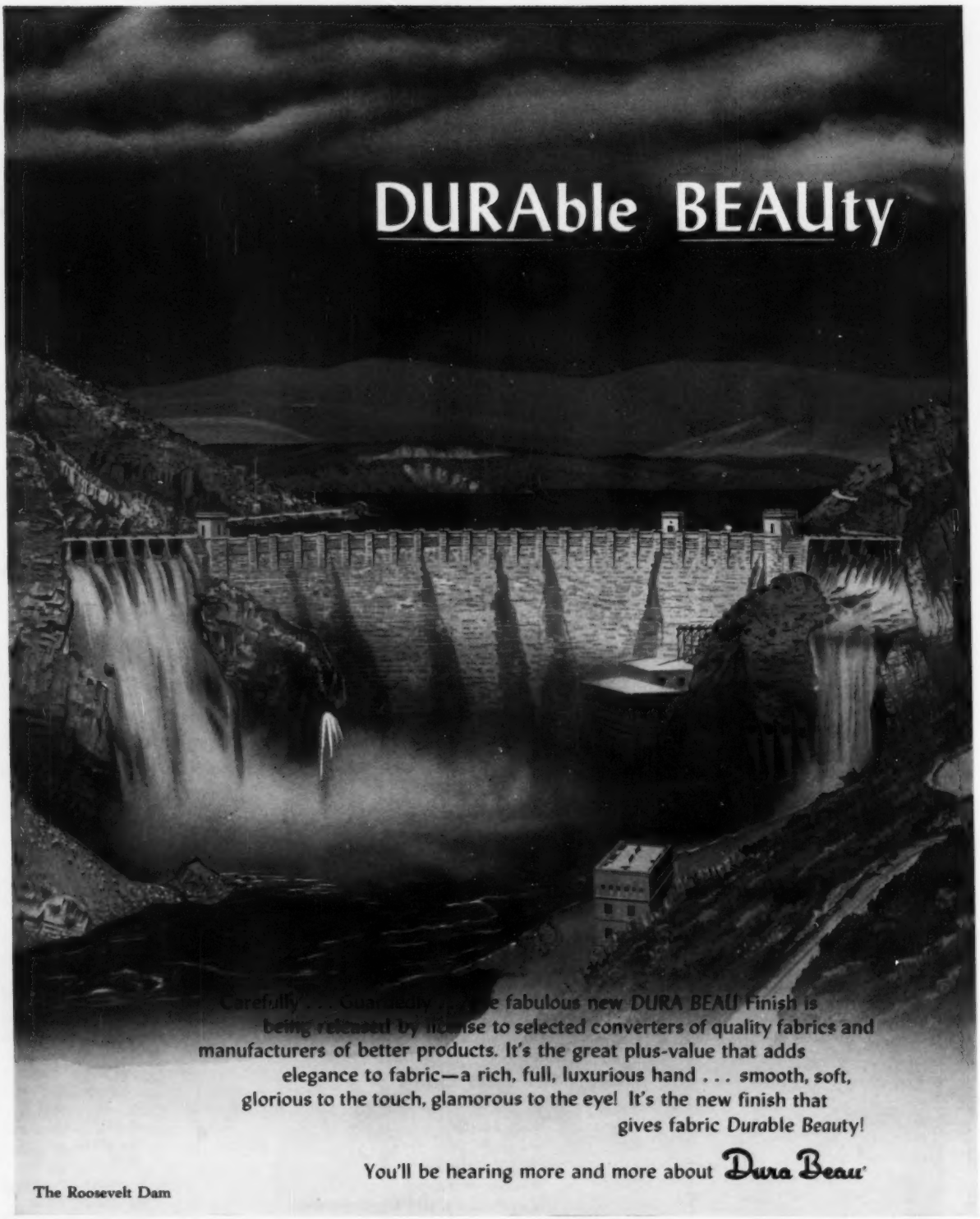

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ADR OPEN FORUM

August 21, 1961

IN announcing last month an expansion program on the grounds of Deering Milliken Research Corp, Spartanburg, SC, probably the most comprehensive privately financed textile research organization in the world, Roger Milliken, president of Deering Milliken, stated that this further investment in research "was being made in spite of the fact that high officials in the State Department seemed determined to further sacrifice the American textile and garment industries".

He said that these "high officials" were, in fact, "doing everything in their power to encourage American textile firms to invest in foreign plants and import their textile needs. He also stated that his company had not made any such investments and has no intention of doing so.

"We are investing our money in these new research facilities, he said, "as a further effort to improve the technology of American textile manufacturing and to maintain America's position as the most efficient textile-producing nation in the world. We have confidence, moreover, that the American people and their representatives in Congress will not tolerate any further loss of jobs in this industry, which employs so many people and is so vital to the defense of the country. This is an industry that is only held back from greater progress because of the competition caused by low Oriental wage rates and an artificial government-authorized cotton raw material advantage available to foreign competition amounting in August to 8½¢ per pound or $42.50 per bale of cotton."

The expansion program has started with work on an addition to the existing chemical research facilities and construction of an entirely new cotton processing and spinning research facility, the latter to follow plans developed jointly by Deering Milliken Research and the Institute of Textile Technology.

While it was stated that Deering Milliken has no intention of investing in foreign plants and importing textile needs, the firm does purchase foreign equipment, and it was stated that the new cotton spinning research unit will include equipment from England, Switzerland, Germany and Japan as well as from the United States. It is stated, however, that purchases of foreign equipment have and will be made only when machinery of comparable performance and quality is not available domestically.

While economics and a feeling of responsibility to the American worker undoubtedly have influenced Deering Milliken's decision with regard to textile production, the firm apparently feels that the science of textile technology knows no boundaries, for its technicians have scoured the world to select the most advanced mill design and machinery construction.

Government officials would do well to note Deering Milliken's approach, for, although the company is atypical of most American textile manufacturing concerns, eg, its progressive research programs and its overall size, its attitude toward competition is not.

* * *

Att: American Dyestuff Reporter
"Open Forum"
Letters to Editors Dept

Gentlemen:

With so many publications, both foreign and domestic, that today's research and development people should keep up with, the availability of time for reading this important information is becoming more and more critical.

For this reason we add our vote to that of Floyd E Colvin, Open Forum, June 26, 1961, as being in favor of more articles in condensed or abstract form rather than fewer, complete papers.

I am sure a poll of your readers would find a majority for this change.

Very truly yours,
Wesley A Gaddes,
Technical Director
Claremont Flock Corp
Claremont, NH

* * *

Dear Editor:

In the June 12th issue you published our letter concerning the "SYMPOSIUM HOCHVEREDLUNG 1961" to be held at Zurich, Switzerland, on October 12 to 14 and also the detailed program on the lectures.

We wish to thank you for your very valuable cooperation. This publication has helped a great deal in making known the Congress to our American friends.

Yours very truly,
Schweiz Verein der Chemiker-Coloristen
(W Kunz, president)

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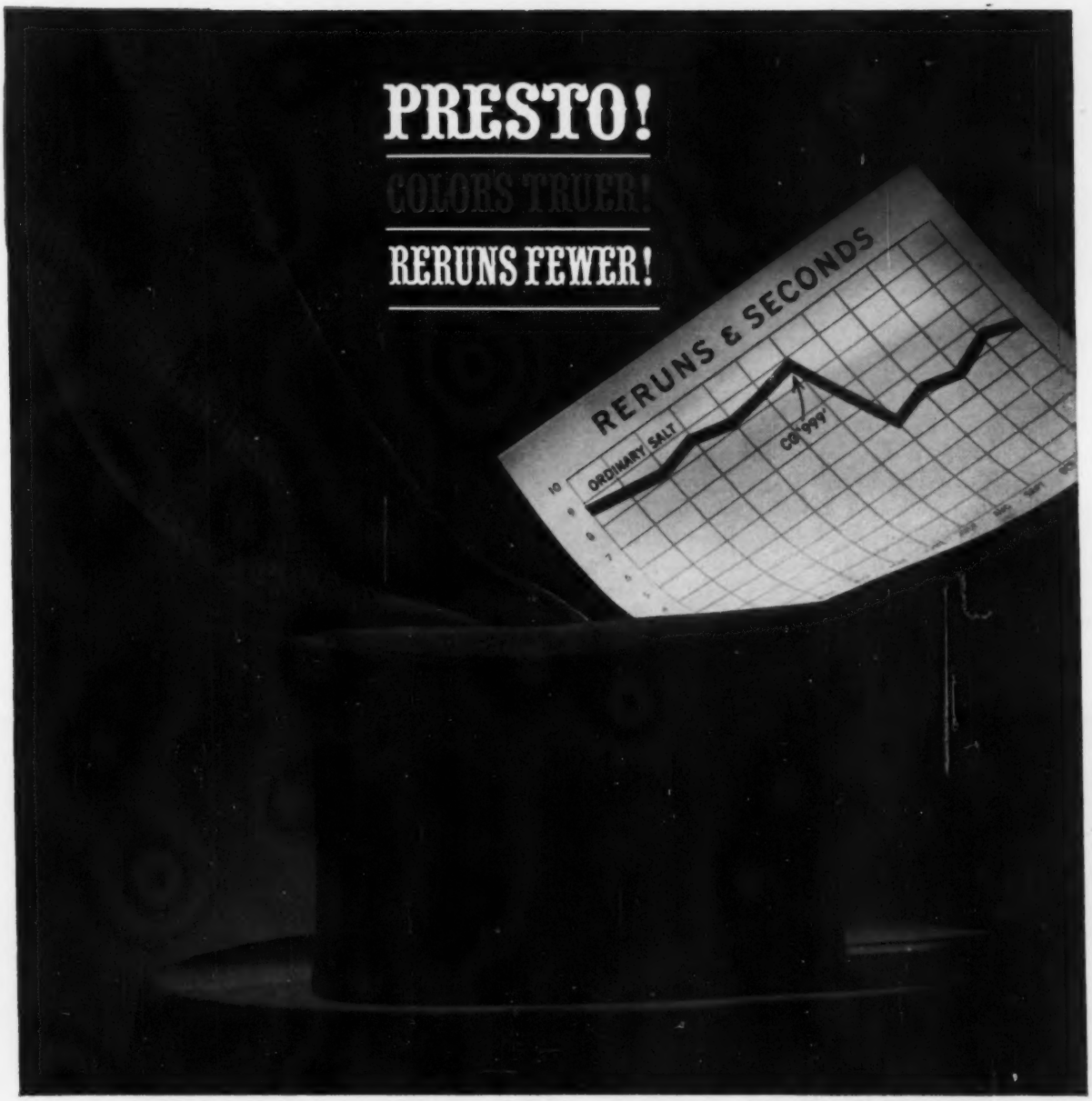

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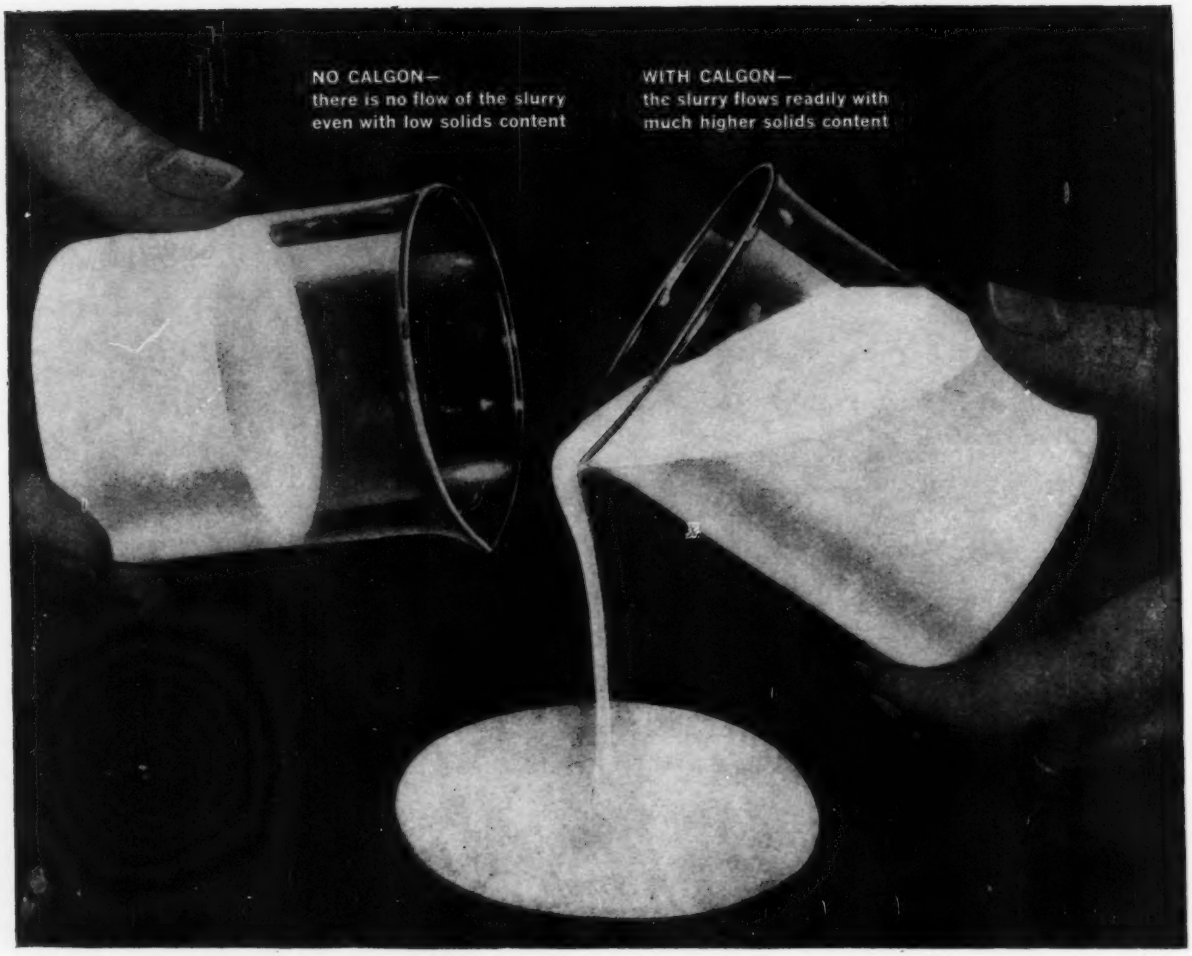
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there is no flow of the slurry
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the slurry flows readily with
much higher solids content

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Textile finishing benefits from Calgon's unique ability to disperse pigments evenly and completely. Clay, calcium carbonate, titanium dioxide and other pigments will give you more uniform finishes when Calgon is used. It is particularly effective for rayon and other synthetic fabrics.

Calgon saves you money—in fewer seconds, fewer re-dyes, less time spent in scouring and in the control of iron contamination throughout the plant. The brochure, "Calgon Data for the Textile Chemist," is yours for the asking. It covers in detail the many ways Calgon* can help step up production, a few of which follow:

Calgon in the Dyebath: Calgon exerts a dispersive and solubilizing action on most dyestuffs and acts as a leveling and penetrating agent.

Calgon in Scouring or Rinse Baths: Calgon supplements the detergent action of soaps and synthetic detergents.

Calgon Conditions Water: Calgon prevents the formation of lime soap curds and acts as a solvent for lime soap as well. Calgon makes water rain-barrel soft.

Threshold Treatment for Corrosion Control:† Calgon prevents the contamination of process water from iron corrosion products. Calgon Threshold Treatment is the most economical and efficient method for eliminating iron contamination.

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†Fully licensed for this use under U.S. Patent No. 2,337,856.

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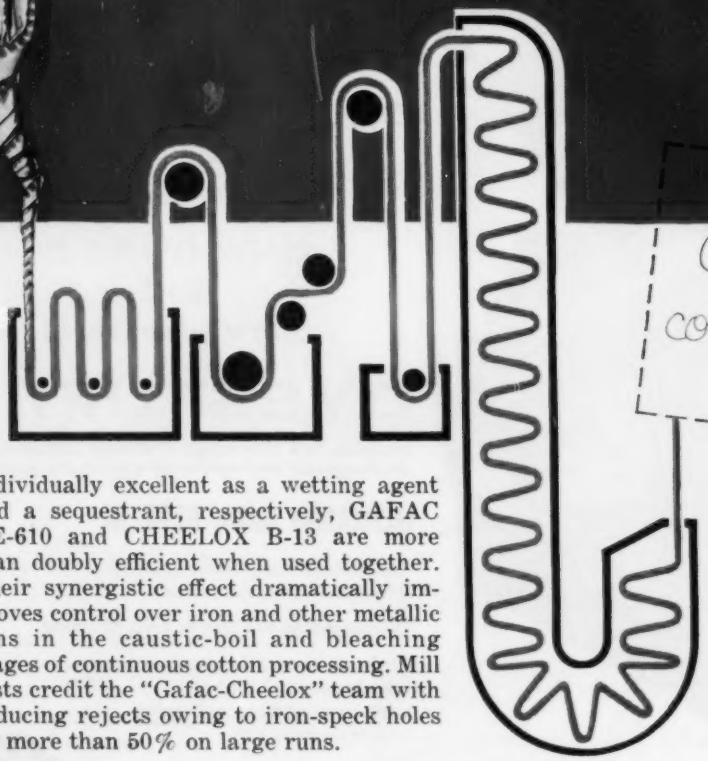
can cut rejects 50% or more in continuous bleaching of cotton goods



Individually excellent as a wetting agent and a sequestrant, respectively, GAFAC RE-610 and CHEELOX B-13 are more than doubly efficient when used together. Their synergistic effect dramatically improves control over iron and other metallic ions in the caustic-boil and bleaching stages of continuous cotton processing. Mill tests credit the "Gafac-Cheelox" team with reducing rejects owing to iron-speck holes by more than 50% on large runs.

GAFAC RE-610 phosphate ester is a new 100%-active anionic surfactant offering a unique combination of properties in high concentration of alkali: good solubility, chemical stability, and oil- and wax-emulsifying ability—even at the boil. Good rinsability too—though residual amounts in the goods will not interfere with dyeing.

GAFAC RE-610 and other GAFAC surfactants are effective at various other stages in the processing of cellulosic and synthetic-fiber yarns, piece goods, and hosiery. Write for data sheet TA-63 entitled "GAFAC Surfactants in Textile Processing."

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ADR

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THE CAUSES OF TAILING IN THE PAD-BATCH DYEING PROCESS

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The technical application of the pad-batch process with Drimarene Z dyes has been described by M Capponi, A Giamara and E Metzger [cf *Am Dyestuff Reptr 50*, No. 14, 23-32 (July 10, 1961)].

The object of this present work was to investigate possible causes of tailing in dyeing with reactive dyes according to the pad-batch method. It was observed that the main causes are the affinitive effect of the dyes, and the depletion of OH-ions in the padding liquor during padding. Both influences can be investigated separately and their impact assessed quantitatively. Except for a few cases, which are mentioned, under normal padding conditions no affinity has been observed when dyeing with Drimarene Z dyes. Application in the padding liquor of a blend of sodium hydroxide—sodium metasilicate as alkaline agent has the effect of repressing the uptake of OH-ions during the padding process.

INTRODUCTION

"TAILING" may be defined as the shade difference between the beginning and end of a given lot. If only one dyestuff is used, this phenomenon may be characterized by a difference in depth of shade. Dyeing with a combination of dyes may also result in differences of shade. This problem is rather complex as, apart from the affinitive effect of the dyestuffs, certain other conditions, ie, changing concentration of the dyebath (which causes variations in dye uptake), have to be considered. Among such conditions we want to point particularly to different degrees of fixation. We will summarize them subsequently as influences on the fixation process.

Conditions of the above type might be described by three practical examples. (See Table I).

TABLE I

Influence of dye affinity and fixation on tailing

Example	*Effect of dye affinity*	*Influence of dyestuff fixation*	*Result*
1	=	−	−
2	−	−	−
3	−	+	=

\+ stands for positive influence, ie, increased strength of the shade
− stands for negative influence, ie, decreased depth of the shade
= stands for "no influence", ie, depth of shade unchanged

Explanation of the examples given in Table I:

Example 1: Dyeing with vat dyes by the pad-steam process without intermediate drying, thus developed in the moist state.
Result: tailing
Causes: influence of the fixation procedure, dilution of the chemical pad liquor.

Example 2: Pad-Roll dyeing with substantive (direct) dyestuffs.
Result: strong tailing effect
Causes: influence of both factors, ie, dye affinity and fixation process. Because of the great length of a batch, a considerable difference exists in the duration of the fixation between the beginning and the end of the lot; the end of the lot has not been fixed long enough.

Example 3: Pad-dyeing with direct dyes, continuous fixation on rollers.
Result: no tailing
The negative influence of the fixation process, ie, detachment of dyestuff by the fixing bath, is compensated for by the positive effect of dye affinity.

The three examples indicate that an investigation of tailing conditions must consider both influences, affinity and fixation.

INFLUENCE OF THE AFFINITY OF THE DYES

The influence of the affinity of a given dye on the tailing effect will be discussed first. As the fabric is immersed, it soaks up the dye liquor, and its fibers undergo swelling. After a certain time of immersion, the excess padding liquid is squeezed out by two or more rollers operated under controlled pressure. Immersion time is the time calculated from the moment of the first immersion to the point where the fabric leaves the last joint of the squeeze rollers. Padding mangles with two or more rollers are used in practice, but the construction of this device is of no relevance in the following investigation. The squeezing effect—usually 60-90% wet pickup—is influenced by the speed of the goods, by the viscosity of the padding liquid, and by the pressure of the rollers, which have to be adjusted for each fabric and for each dyeing procedure. During immersion, the fabric takes on about 200% of its own

TABLE II

Material	Number & weight of the cloth discs	Pad liquor (ccm)	Corresp bath ratio	Weight of discs after vacuum draining	Squeeze effect (%)
Bleached cotton	4=2.7 g	5.1	1:1.9	5.3 g	96.0
Mercerized cotton	5=2.7 g	5.1	1:1.9	5.2 g	92.5
Spun rayon	4=3.4 g	6.5	1:1.9	6.5 g	100.0

weight in liquor. The excess dye liquor is returned to the trough for the sake of economy, but also depending on the construction of the equipment. The dye concentration of the liquor which was pressed out and returned to the trough is decisive in the tailing effect; if this re-used portion of the bath has given up too much of its dyestuff content, the rest of the liquor is diluted, and the dyeing becomes increasingly light. The amount of dye carried off by the fabric has to be made up by adding fresh liquor. After a time, an equilibrium is attained in the padding liquid as well as in the depth of shade of the goods, but the latter is lighter than the depth of the shade obtained at the start.

The opposite condition occurs when there is a smaller uptake of dye than that which corresponds to the ratio of dyestuff:water, causing increased concentration of dye in the padding liquor, thus an increased depth of shade on the other end of the fabric ("reverse tailing"). Although reactive dyestuffs are characterized by a relatively high speed of diffusion, the above process can only occur in the very limited immersion time on the restricted surface region of the fiber in contact with the dyebath.

In order to find a quantitative ratio of the uptake of the dye under the above conditions, we impregnated a fabric with 200% dye liquid (owf) and squeezed out after a certain immersion time, and the resulting dyestuff concentration of the squeezed-out solution was determined.

DESCRIPTION OF EXPERIMENTS——Materials used for the experiments consisted of mercerized and bleached cotton and nondelustered spun rayon, which were cut into round discs of 0.8 cm diameter and conditioned in a chamber at 25°C and 60% relative humidity to constant weight. The receptacle for the padding liquor was especially made for this experiment. It consisted of a glass plate with a cavity, exactly the diameter of the discs. Depending on the thickness of the material, three to five discs of the fabric, of 2.7-3.4g weight, were used for each dyeing test.

The amount of padding liquor corresponded in each case to a ratio of 1:1.9 (see Table II). The liquid was absorbed immediately and almost completely upon immersion. After a predetermined time, equal to the immersion time, the glass plate with the fabric disc was placed upside-down on a suction plate and the specimens were suddenly drained by vacuum suction. The dyestuff concentrations of the squeezed and the original padding liquor were measured with the photoelectric colorimeter "Metroohm E 1009". These changes can be expressed by a quotient as follows:

$$\text{Quotient F} = \frac{\text{Dyestuff concentration of the liquor squeezed out}}{\text{Dyestuff concentration of the original pad liquor}}$$

Quotient F indicates the extent to which affinity takes place during padding. Quotient F < 1 points to a reduction of the concentration of the dye liquor during padding, causing tailing. If however, Quotient F is $>$ 1, the dye has the tendency to accumulate in the padding liquor and this condition causes reversed tailing.

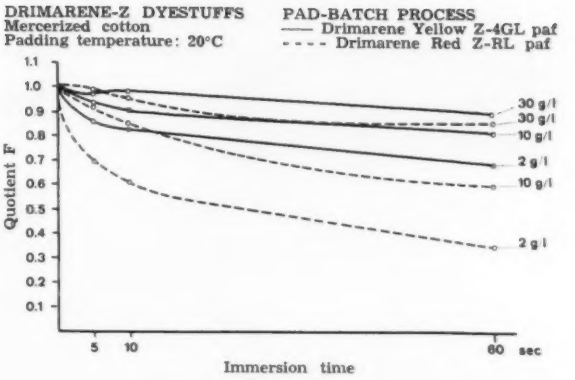

Figure 1
Dependence of Quotient F on immersion time and dye concentration on mercerized cotton

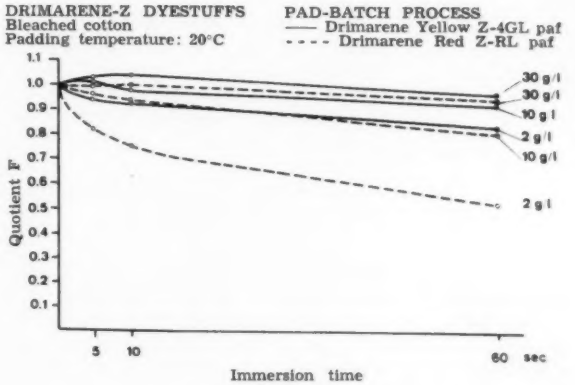

Figure 2
Dependence of Quotient F on immersion time and dye concentration on bleached cotton

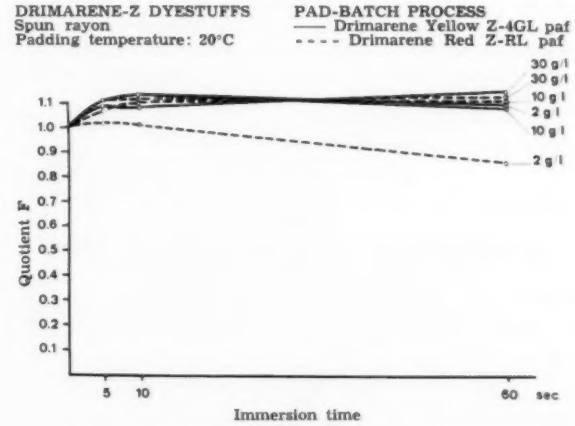

Figure 3
Dependence of Quotient F on immersion time and dye concentration on spun rayon

If Quotient F = 1, no change of the dyestuff concentration in the pad liquor occurred.

DISCUSSION OF RESULTS——The correlation of the Quotient F with immersion time, material, and dyestuff concentration, in pad liquors containing Drimarene Yellow Z-4GL paf and Drimarene Red Z-RL paf was investigated first. Results on mercerized cotton are

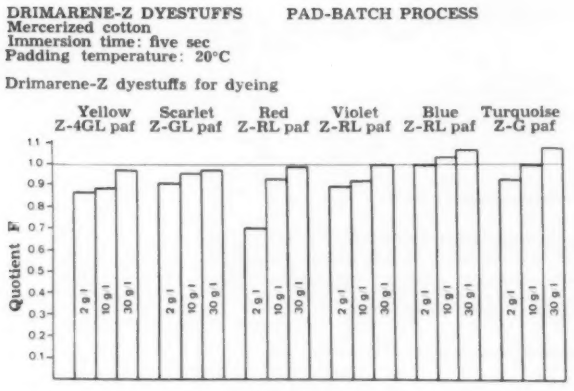

Figure 4
Quotient F of various Drimarene-Z dyestuffs in three concentrations on mercerized cotton

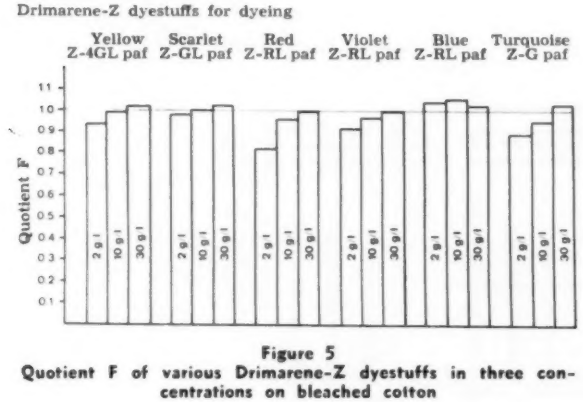

Figure 5
Quotient F of various Drimarene-Z dyestuffs in three concentrations on bleached cotton

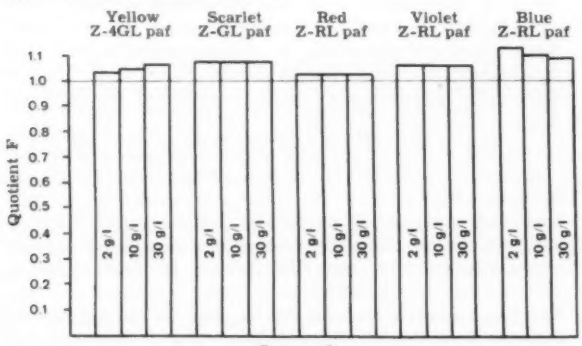

Figure 6
Quotient F of various Drimarene-Z dyestuffs in three concentrations on spun rayon

compiled in Figure 1. Quotient F evidently depends, in Drimarene Red Z-RL paf dyeings, on the dye concentration. At a concentration of 2 g/l, a strong reduction of dyestuff content can be noticed, especially if long immersion times are applied, but at a concentration of 30 g/l, no reduction occurs even after five seconds immersion.

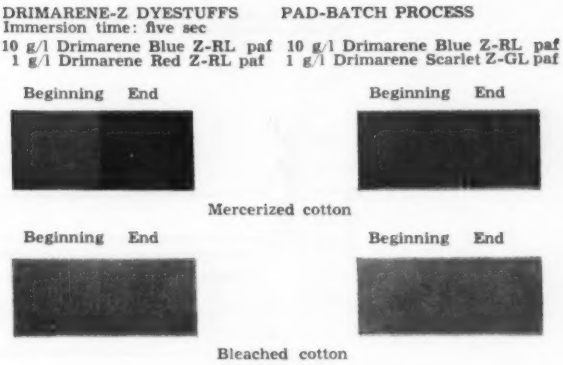

Figure 7
Effect of dye affinity in padding (bulk dyeings)

Drimarene Yellow Z-4GL paf generally behaves the same way, and Quotient F depends here also on the dye concentration, though in a somewhat smaller amount. Both dyes show a more favorable result in this respect on bleached cotton. (See Figure 2). Here, Quotient F depends only slightly on immersion time and dye concentration. An exception will be noted in the result for Drimarene Red Z-RL paf. Regarding Figure 3 (spun rayon), Quotient F is greater than 1 for both dyes irrespective of the concentration. Both dyes have a tendency to concentrate a little in the dye liquor during the padding process, which, in extreme instances, could tend toward "reverse tailing".

It may be concluded that the two dyes mentioned above definitely show that Quotient F (tendency to tailing) depends on the specific material. Mercerized cotton causes greater reduction of strength of the pad liquor during padding than does bleached cotton. The spun rayon quality used in the tests caused even accumulation of the dye in the liquor. Moreover, Quotient F also depends on the dye concentration, particularly in the dyeing of mercerized cotton. Surprisingly, immersion time did not substantially influence the results except in very light dyeings on cotton only.

Figures 4, 5, and 6 show the behavior of some Drimarene dyestuffs in varying concentrations, and on different materials. Quotient F here refers to an immersion time of five seconds. In comparison with actual conditions of application today, the above experimental conditions have to be considered as very unfavorable ones for padding. However, it appeared imperative to use an immersion time of five seconds to make exact measurements possible. Regarding the other Drimarene Z dyes, we found here, also, that usually the same conditions prevailed as for the red and yellow.

In order to prove the validity of our conclusions, we carried out some tests in practical work with selected Drimarene Z dyes. We used the same immersion time, five seconds. We chose as textile material mercerized cotton fabrics, and as dyestuffs, Drimarene Blue Z-RL paf shaded with Drimarene Red Z-RL paf and Drimarene Blue Z-RL paf shaded with Drimarene Scarlet Z-GL paf. According to the values of Quotient F on the same material, the combination with Drimarene Red Z-RL paf on mercerized cotton should show strong tailing, and on bleached cotton moderate tailing effects only. By replacing Drimarene Red Z-RL paf with Drimarene Scarlet Z-GL paf, practically no tailing should occur. Figure 7 demonstrates that the practical results are in agreement with our measurements.

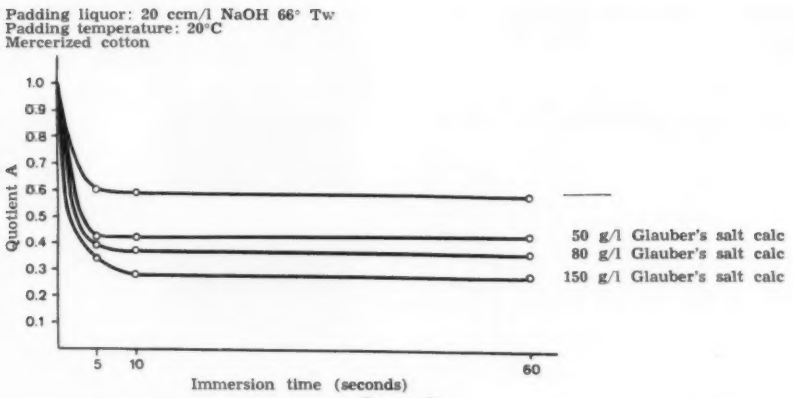

Figure 8
Dependence of Quotient A on immersion time and the electrolyte concentration on mercerized cotton

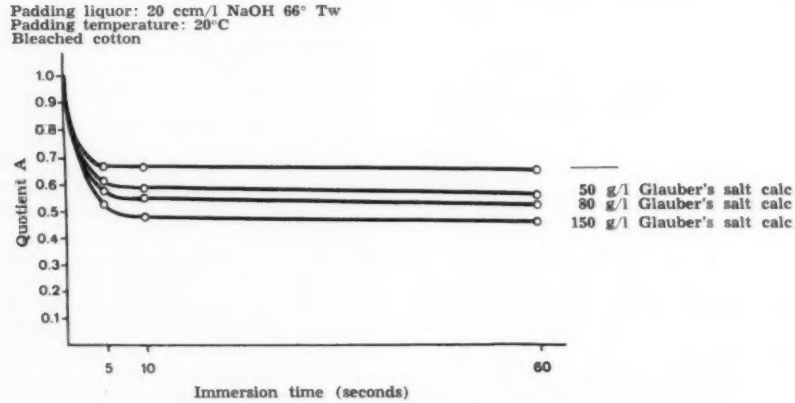

Figure 9
Dependence of Quotient A on immersion time and the electrolyte concentration on bleached cotton

Differences in hue appearing at the beginning and the end of the batches may depend on the material, on the individual dyestuff, on the concentration of dye in the pad liquor or, as far as cotton dyed in very light shades is concerned, on the immersion time. Immersion time in padding very light shades on mercerized cotton has to be as short a possible, and may be increased only in dyeing heavy fabrics or fabrics difficult to penetrate, in which cases the dyes have to be carefully selected. However, with a few exceptions due to very unfavorable padding conditions, the Drimarene dyes show no tailing because of affinity effects.

INFLUENCE OF THE FIXING PROCESS

Time and temperature influence the yield in the cold pad-batch dyeing process. It has been demonstrated that the yield also depends upon the alkali concentration. (See Figure 12). An optimum for most of the Drimarene dyes is between 10 and 20 ccm NaOH 36° Bé per liter, and changes in the alkalinity of the bath may sometimes influence tailing. An optimum is attained by increasing the alkali content to a certain point after which the yield decreases as alkali concentration increases. In view of these facts, we investigated the extent to which the material absorbed OH-ions from the padding liquor.

DESCRIPTION OF EXPERIMENTS———In accordance with the previously described procedure, the alkalinities of the original and the squeezed-out padding liquor were determined by potentiometric titration with n/10 HCl. Alkalis used for fixation of less reactive dyes, in accordance with the pad-batch method, were investigated, ie, sodium hydroxide alone or combined with trisodium phosphate or sodium metasilicate. Our measurement of the change in alkalinity of the liquor during the padding process is represented by Quotient A:

$$\text{Quotient A} = \frac{\text{alkalinity of the liquor squeezed out}}{\text{alkalinity of the original liquor}}$$

Quotient A is therefore the quotient calculated by dividing the ccm n/10 HCl corresponding to the squeezed-out pad liquor, by the volume of the original solution. In titrating solutions which contained sodium triphosphate, only the first phase of neutralization

$$PO_4''' + HOH \longrightarrow HPO'' + OH'$$

has been taken into account, because in the squeezed-out dye liquor, as well as in the original liquor in the second phase of neutralization, the same concentration of anions was found. It must be concluded that only OH-ions are taken up by the fiber under the conditions corresponding to those which prevailed in the experiment, proving that a substantial reduction of OH-ions occurs in the pad liquor. The yield, ie, the dyeing effect, can definitely be improved by adding electrolytes to the padding bath whenever reactive dye of low substantivity are applied in the pad-batch

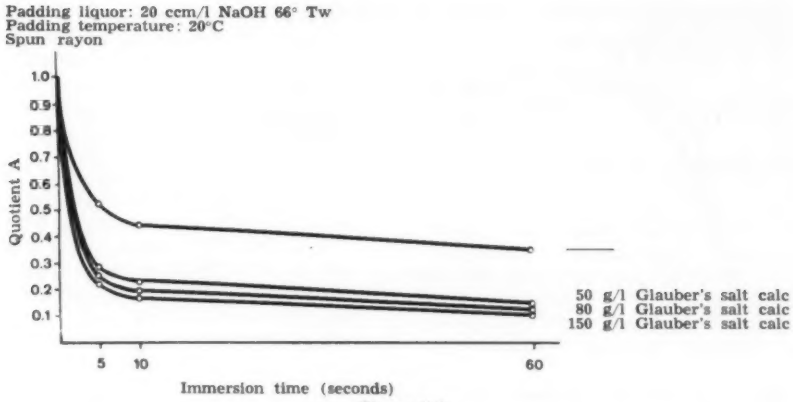

Figure 10
Dependence of Quotient A on immersion time and the electrolyte concentration on spun rayon

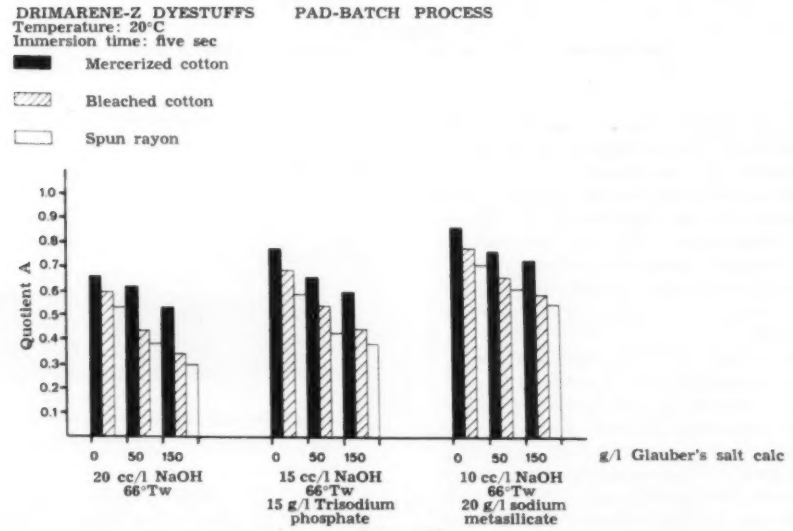

Figure 11
Quotient A of various alkalis in dependence on the electrolyte concentration

process; moreover, commercially available dyes, as a rule, are standardized with electrolytes. Consequently, concentrated padding liquors may contain considerable amounts of electrolytes, and the influence of concentration of electrolytes upon changes of alkalinity of the pad liquor has been considered for this reason.

DISCUSSION OF RESULTS——Figures 8, 9, and 10 refer to the relationship of Quotient A to the immersion time for mercerized cotton, bleached cotton, and spun rayon. The padding solutions contain 20 ccm/l sodium hydroxide 36° Bé per liter and varying amounts of calc Glauber's salt. Reduction of the amount of OH-ions during padding of mercerized cotton is very high and becomes constant within five seconds. Bleached cotton behaves almost the same way, and the uptake of OH-ions proceeds very quickly too; but "A" depends somewhat less on the concentration of electrolytes. A substantially stronger decrease in OH-ion concentration in the padding liquor was observed in the processing of spun rayon, as compared with cotton; here, in contrast with cotton, equilibrium apparently is not reached within five seconds. The presence of Glauber's salt has a strong effect on the uptake of OH-ions, as in mercerized cotton.

Analogous tests have been carried out with mixtures of sodium hydroxide—sodium metasilicate, and sodium hydroxide—sodium triphosphate. The measurements for quotient A, after five seconds immersion time, are shown in Figure 11. Reduction of OH-ions is strongest in solutions of nonblended sodium hydroxide: lesser reduction was found in solutions of sodium hydroxide—trisodium phosphate; but as far as least exhaustion of OH-ions was concerned, the best results were obtained from a blend of sodium hydroxide with sodium metasilicate. The strong impact of electrolytes present in such blends is evident.

This compilation proves also that the effect of a high amount of added salt (up to 150 g calc Glauber's salt per liter for cotton, and 80 g per liter for spun rayon) is overcompensated if the sodium hydroxide in the pad liquor is replaced by a blend of sodium hydroxide with sodium metasilicate. Therefore, a mixture of the latter type is preferable if the alkalinity of the liquor is to

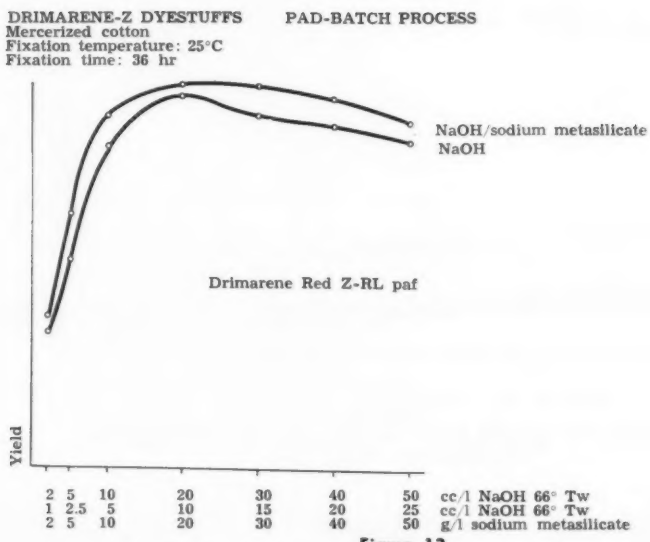
DRIMARENE-Z DYESTUFFS PAD-BATCH PROCESS
Mercerized cotton
Fixation temperature: 25°C
Fixation time: 36 hr
NaOH/sodium metasilicate
NaOH
Drimarene Red Z-RL paf
Yield
2 5 10 20 30 40 50 cc/l NaOH 66° Tw
1 2.5 5 10 15 20 25 cc/l NaOH 66° Tw
2 5 10 20 30 40 50 g/l sodium metasilicate

Figure 12
Dependence of yield on alkali concentration in padding liquor

be changed as little as possible during padding. Furthermore, Figure 12 shows that a broader range of optimum fixation is effected by the above blend than by sodium hydroxide alone, and that better dyeing yields are a further advantage in the application of sodium hydroxide—sodium metasilicate mixtures. In order to assess this effect in practice, comparative dyeings were made, using mercerized cotton and, in one case, a blend of sodium hydroxide—sodium metasilicate; in the other, sodium hydroxide alone.

Any affinitive effect of the dye that was used in padding obviously had to be completely eliminated in such experiments. The dye used here, we know from previous trials, does not show any affinity on mercerized cotton, not even in long immersion time—if applied in concentrations over 20 g/l. The padding baths were therefore prepared with 30 g/l dyestuff, 150 g/l calc Glauber's salt and a) with 15 ccm/l NaOH 36° Bé, and b) with 10 ccm/l NaOH 36° Bé and 20 g/l sodium metasilicate. Both batches were stored for 36 hours at 20 to 25°C. The dyeings were then washed. Batch "a" showed definite tailing, while "b" had the same shade from beginning to end (see Figure 13).

CONCLUSION

In conclusion, it may be stated that the causes of tailing in dyeing in the pad-batch method may be

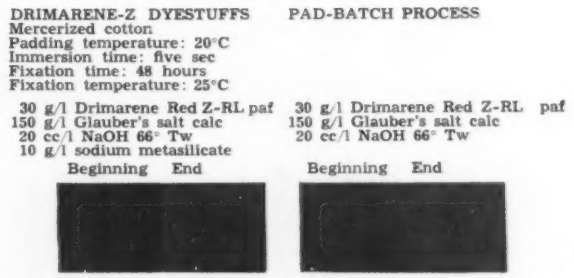
DRIMARENE-Z DYESTUFFS PAD-BATCH PROCESS
Mercerized cotton
Padding temperature: 20°C
Immersion time: five sec
Fixation time: 48 hours
Fixation temperature: 25°C
30 g/l Drimarene Red Z-RL paf
150 g/l Glauber's salt calc
20 cc/l NaOH 66° Tw
10 g/l sodium metasilicate
Beginning End
30 g/l Drimarene Red Z-RL paf
150 g/l Glauber's salt calc
20 cc/l NaOH 66° Tw
Beginning End

Figure 13
Dyeings from mill production; dyed with caustic soda /sodium metasilicate and the caustic soda formulas

traced to the effect of affinity during padding as well as to the decrease of OH-ion concentration during padding. The impact of both influences can be studied separately by the method described above. The results may be interpreted as showing that, in all but a few exceptional cases, when padding with Drimarene-Z dyes under normal working conditions there is practically no affinity. The sodium hydroxide—sodium metasilicate formulations suggested here make it possible to avoid any tailing that is caused by a decrease in the OH-ion content during padding.

ADR ABSTRACTS

Making Spinnerets for Profile Fibers

Anon, *Man-made Textiles 38*, 34-5, March, 1961

There is intense interest in synthetic fibers with modified cross-sections. Throughout the world fiber producers are engaged in investigating, evaluating and developing such new types of fibers.

We have seen in Britain the startling effects that can be obtained, as with the two triangulated fibers developed by British Nylon Spinners. The first has three concave surfaces which result in an inherent glitter effect. The other, with a triangular or cloverleaf profile, is the nearest thing to silk so far produced in a synthetic, the author says.

That such fibers will become an integral part of most

fiber producers' ranges is predicted by the author. The main difficulty facing the producers will then be the manufacture of suitable spinnerets.

In anticipation of this, several people have already started work on the development of techniques that will give spinnerets in suitable shapes and be at the same time "clean" on all faces.

One firm, the Baker Platinum Div of Engelhard Industries Ltd is now regularly making spinnerets with Y-shaped holes in 18/8 stainless steel. The length of the slot is 0.042 inch, and the width 0.005 inch.

Details of the type of equipment used in the manufacture of these specialized products have been released in West Germany by Carl Zeiss of Oberkochen/Wuertt. They construct a special electron-beam milling machine for the purpose. It is able to mill complicated slots 0.1 mm wide or less. Instead of the traditional tool for cutting the metal, a beam of electrons is used. This system, incidentally, is equally suitable for either metal or ceramic machining.

The electron beam operates in a vacuum and is directed on to the workpiece zone which may be anything from 0.01 to 0.1 mm diameter. The beam is absorbed by a very thin surface layer of the material and its energy is converted into heat, causing the material in this small volume to melt and vaporize.

By suitable control the electron beam removes the material in a small, sharply defined area without at the same time substantially raising the temperature of the surrounding material.

The time required to mill a profile hole depends very much on the material being processed and the amount of it that has to be removed. For example, a slot 50 microns wide and 3 mm long in a steel plate 0.5 mm thick can be processed in 20 to 30 seconds.

The operation of the electron-beam milling machine is described in detail. Included is an illustration showing 28 different possible shapes of spinneret holes that can be produced by this process.

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Paper Chromatography of Disperse Dyes

Gasparic, J and Taborska, I, *J Soc Dyers & Col 77*, 160-1, April, 1961

For the paper-chromatographic separation and identification of disperse dyes some methods have already been recommended (eg, see *ADR 49*, #26, 29, 1960). The authors now report their results in this field.

Disperse dyes are azo or anthraquinonoid derivatives insoluble in water, but soluble in organic solvents. In an earlier paper the authors showed that such compounds must be chromatographed in solvent systems in which non-aqueous solvents are used as the stationary basis. Recently they reported that for separation and identification of simple aminoanthraquinone derivatives the solvent system 1-bromonaphthalene/pyridine:water (2:1 or 1:1) is suitable. They have now found that this solvent gives excellent results with disperse dyes.

Hundreds of disperse dyes have been chromatographed, and in all cases good resolution and well-formed, round spots were obtained.

The results of chromatographs of five typical disperse dyes (three browns and two blacks, all obviously mixtures) are shown. They were obtained on Whatman #3 paper impregnated with a 1:10 solution of 1-bromonaphthalene in chloroform; the mobile phase was a 1:1 mixture of pyridine and water, saturated with 1-bromonaphthalene.

In some cases the following solvent systems have also been found of value: 1-bromonaphthalene/90% acetic acid; lauryl alcohol/ethanol:ammonia (1:1); and lauryl alcohol/ethanol:*N* hydrochloric acid (1:1).

To obtain information quickly, it is often possible to use papers impregnated with formamide; hexane, benzene, chloroform, or mixtures of these compounds can be used as mobile phases.

Ten references to the literature are cited.

●

Fiber Identification

Lindley, F W and Beaumont, C, *Dyer 125*, 871, 880, June 16, 1961

Textile fibers fall into three main classes: the natural fibers, man-made regenerated cellulose fibers, and man-made synthetic fibers. Simple physical and chemical tests are usually sufficient to place a fiber in one of these groups. To distinguish fibers in the same group can sometimes call for more complicated tests; eg, solubility, burning, staining, or special chemical tests.

The usefulness of the microscope is emphasized; eg, man-made cellulosic fibers usually have crenelated cross-sections, while synthetic fibers ordinarily have smooth cross-sections. However, this test is not an infallible guide nowadays.

A solubility test usually differentiates between secondary acetate (soluble in acetone) and triacetate (insoluble), but a silicone finish will affect the solubility of secondary acetate in acetone.

The technique of "optical solubility" is useful in certain cases. If a fiber is mounted in a liquid of the same refractive index, it is practically invisible, whereas if fiber and mountant have very different refractive indices, the fiber will stand out clearly. By mounting a blend of viscose and acetate in water, methyl salicylate or liquid paraffin, it is possible to see both fibers clearly, or the acetate alone or the viscose alone, the other fiber of the pair having been "optically dissolved".

Commercially available stains such as Shirlastain, Neocarmin and Du Pont Identification Stain #4 are easy to apply. A new staining test developed recently at Courtaulds distinguishes between certain acrylic fibers. Orlon Type 42 is stained red, Acrilan green, and Courtelle pale orange.

Terylene fibers in a Terylene/nylon blend may be identified by a special optical test. If Terylene is mounted in a mixture of one part monobromonaphthalene and three parts methylene iodide, the fiber can be made to appear and disappear by viewing the image through a rotated polaroid sheet.

Polyethylene and polypropylene fibers can be distinguished by their different melting points. The Beilstein copper-wire test may be used to identify fibers containing chlorine (eg, Dynel).

Several text-books containing useful identification methods are cited.

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Woven Stretch Fabrics— a New Frontier in Textiles?

Thomas, P M, *Modern Textiles 42*, 22, Feb, 1961

"The U S textile market is poised for what may well be a surging breakthrough of woven stretch fabrics". In the next two to five years, demand for these new fabrics may vitally affect manufacturing and finishing techniques, garment manufacturing, and buying practices of department stores, the author predicts.

So far, the US market has seen woven stretch fabrics only from Europe and a couple of U S experimenting mills, but estimates are that about 25 mills are now at work on a sample-weaving basis. Nearly all converters are experimenting.

What are woven stretch fabrics? Called variously "textured yarn fabrics," uni-directional stretch fabrics,"

and plain "woven stretch fabrics," these fabrics are woven with false-twist textured man-made yarns or conventional Helanca nylon yarns. At present, most of them are woven of standard warps, usually cotton, and stretch filling, nearly always textured continuous filament nylon.

They offer an endless variety of constructions. Stretch can be controlled to almost any amount. The fabrics can have stretch filling, stretch warp, or both. Fabric construction can be for anything from a sheer blouse to heavy sportswear.

One of the greatest advantages, the author says, that woven stretch fabrics possess is the variations that can be obtained in finishing. It is possible for a mill to weave basic stretch fabrics and vary the finishing techniques to obtain a whole range of finished hands.

The prediction is that for the next year or two the big volume of woven stretch fabrics will be in cotton warps and stretch filling, since these are much easier to weave and finish than warp stretch fabrics.

The immediate prospects for these fabrics in the US market are said to be best for sportswear, eg, women's slacks and sports jackets, and particularly ski suits, but the mills are also said to be experimenting with dresses, blouses, shirts and pajamas.

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New Observations on the Tippy Dyeing of Wool

Hadfield, H R and Lemin, D R, *J Soc Dyers & Col 77*, 97-105, Mar, 1961

Variations in the dyeing properties of single wool fibers along their length, commonly known as "tippiness", are caused by the fact that the tips of the fibers, while on the sheep's back, are exposed to weathering and mechanical action during growth, and in consequence dye differently from the body and root ends of the fibers which have been protected.

The authors point out that tippy dyeing of wool was first discussed, back in 1928, by von Bergen, who reported both "positive" and "negative" dyeing effects. In the first case the tips were dyed more heavily than the roots, and in the second case, less heavily. Von Bergen found that milling acid dyes tended to give "positive" tippy dyeing, while level-dyeing acid dyes generally gave "negative" effects.

The authors review the work of previous investigators of the "tippy dyeing" problem, and give full details of their own researches. They were able to show that the production of "skittery" dyeing of wool (uneven dyeing resulting from random differences in dyeing behavior from fiber to fiber, or along a single fiber, as in tippy dyeing) depends on "(a) the hydrophilic/hydrophobic properties of the wool surface, and (b) the hydrophilic/hydrophobic balance of the dye."

The authors state that a normal wool fiber generally has a hydrophobic surface, except where the fiber is damaged, when the surface becomes more hydrophilic. During the initial period of dyeing, before subsequent leveling of dye can reduce the effect, the absorption of dye by the wool fiber can be very greatly influenced by the hydrophobic nature of the fiber surface. Initial absorption also depends on the properties of the dye. If the dye is very hydrophilic, differences in the hydrophobic properties of the fiber surface are reflected in differences in dye absorption. For this reason hydrophilic dyes are tippy dyeing.

If, on the contrary, the dye is more hydrophobic, it can diffuse more readily through the hydrophobic surface layers of the fiber, where these are present, and there will, as a result, be less contrast between the hydrophilic and hydrophobic portions of the wool surface. For this reason hydrophobic dyes are less tippy dyeing.

Information on the hydrophilic nature of the wool surface was obtained by contact angle measurements, and on the hydrophobic properties of the dye by measurements of partition between water and butyl alcohol saturated with water.

Twenty-nine references to the literature are cited.

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The Drycleaning and Laundering of Textile Materials

Sands, G W, *Can Textile J 78*, 47-55, Jan 6, 1961

Drycleaning. Perchlorethylene is widely used as the solvent; compared with Varsol and Stoddard Solvent it has the advantage of nonflammability, and it evaporates more slowly than carbon tetrachloride and trichlorethylene.

Nearly all fabrics may be cleaned in perchlorethylene, but care must be taken to test thoroughly any garments which have plastic trims, as perchlorethylene is a solvent for some common plastics. Occasionally, certain dyes, especially on cotton fabrics, will bleed in the solvent.

All units installed employing perchlorethylene should be adequately equipped with ventilating systems to remove excessive solvent vapors.

Garments to be drycleaned are first classified as "Wools" (those composed wholly or principally of wool), "Silks" (including also fine acetates, cottons and rayons) and "Synthetics" (the new man-made fibers), and are also separated into "lights" and "darks". If stains are present, the garments are pre-spotted; a list of suitable spotting agents is included.

A "charged solvent" is one which contains a drycleaning soap, usually a nonionic synthetic detergent. These soaps have dirt-suspending action, and also emulsify any moisture present in the garments.

After treatment with the charged solvent, rinsing and extracting, the clothes are usually tumble-dried at 120-130°F. They are then inspected for stains still present, and are spotted accordingly.

In steam pressing, owing to the new synthetic fibers used in fabrics these days, such as "Terylene", temperatures and steam pressures at the press head must be controlled in order to prevent glazing, which actually is a melting of the polyester fiber, and shrinkage, which is a reduction in yarn size and shape. Terylene, for example, should not be heated higher than 285°F.

Laundering. Here water is used as the liquid, as distinct from drycleaning. The purpose is to remove "soil", which may appear as "grease", "soluble soil", "insoluble soil", or "miscellaneous soil". The garments are classified, as in drycleaning, but mostly as to size

The chemicals used in the wash formulas employed in laundries are alkalis, soaps, sours, optical agents, and last but most important of all, water. The water should be close to zero hardness; thus, water filters and softeners are very important. Rust must be avoided.

Low-titer soaps are used for low-temperature work on blood-stained or colored garments, and high-titer soaps for work on white goods. Laundry soaps are usually slightly alkaline. Optical agents are used to create a "whiter-than-white" effect.

The author also discusses the types of complaints received by the drycleaner and laundry, and the troubles caused by the splitting of drapery fabrics, the lack of drycleaning fastness of many pigment and flock prints, etc, etc.

WRINKLE- AND MUSS-RESISTANT FINISH FOR COTTON USING FORMIC ACID COLLOID OF METHYLOLMELAMINE

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Cotton fabric has been made wrinkle resistant by treating with a freshly prepared formic acid colloid of methylolmelamine. Previous investigations have shown that acid colloids allowed to age for 12 to 24 hours do not impart wrinkle resistance. The method of application of the freshly prepared acid colloid is essentially the same as used for resin finishing; that is, pad, dry, and cure. The main difference is the use of formic acid in the treating solution to produce a colloid and to serve as the catalyst. Curing is accomplished at 140°C.

Print cloth finished with the acid colloid of methylolmelamine at about 7% resin add-on has good wrinkle and muss resistance. Properties of finished fabrics compare favorably with those of fabrics finished by a conventional process. Properties compared include breaking strength, tear strength, wrinkle recovery, chlorine damage, and nitrogen retention, after five, 10, and 20 wash and tumble-drying cycles.

Although acid colloid-finished print cloth yellows less when treated with strong sodium hypochlorite solutions than does conventional trimethylolmelamine-finished cotton, the finish is not recommended for white goods. Microscopical studies were made on fibers treated with the formic acid colloid of methylolmelamine by examination of cross sections stained with CI Acid Blue 1 and by treating ultra-thin sections with cupriethylenediamine hydroxide. The resin was deposited primarily in the outer portion of the cell wall of the cotton fiber, and the innermost section of the fiber responded to cupriethylenediamine hydroxide in a manner similar to that observed for cotton having small amounts of crosslinked cellulose.

INTRODUCTION

COTTON fabric has been made wrinkle resistant by treating with a freshly prepared formic acid colloid of methylolmelamine. A recent study in these laboratories (*1*) of application techniques of methylolmelamine resins to cotton revealed a practical method for producing cotton fabric with excellent rot and good weather resistance, which was based upon the use of a freshly prepared acid colloid of methylolmelamine. In previous work with acid colloids of methylolmelamine, American Cyanamid Co (*2*) showed that aged acid colloids will give excellent shrinkage control and crispness of hand that has good durability to washing. Also, there was no loss in tensile strength on cotton and wrinkle resistance was apparently not obtained. Studies of Nute (*3*) and Nuessle (*4*) demonstrated that aged acid colloids do not impart wrinkle resistance. Investigations by Wannow (*5*) on the use of acid colloids for finishing textiles reported that a wrinkle-resistant effect is not obtained with these colloidal or large-particle dispersions, but there is a stiffening of the fabric. In all of the above studies the colloids were permitted to age from 12 to 24 hours, thus allowing rather large colloidal particles or polymers to form which were deposited largely on the surface of the fiber. In each of the above studies aged acid colloid solutions were applied to the cotton fabrics. Also, a methylated trimethylolmelamine was used, rather than the unmethylated trimethylolmelamine which was used in the present work.

The purpose of this paper is to present a method of using an acid colloid of methylolmelamine to impart wrinkle resistance to cotton fabrics. The method of application of this acid colloid is essentially the same as that conventionally used for resin finishing; that is, pad, dry, cure. The main difference is the use of formic acid in the treating solution to produce a colloid and to serve as the catalyst. Addition of a latent acid catalyst such as normally used in the conventional processes is omitted. The term acid colloid as used in this paper refers to methylolmelamine molecules and polymers of trimethylolmelamine which are associated and stabilized by polar acid molecules. All of these colloids are water-clear but possess light-scattering properties.

MATERIALS AND METHODS

FABRIC DESCRIPTION———The cotton material used in these experiments was a desized, scoured, and bleached 80 × 80 print cloth weighing approximately 3.2 oz/sq yd.

CHEMICALS USED———The N-methylol compounds used were commercial products sold under various trade names. The compounds were unmethylated methylolmelamine (Resloom HP[2]; Aerotex Resin UM Special[2]). Formic acid (90% purity) was a commercially available product. Latent acid catalysts used were zinc nitrate (Catalyst H-7)[2] and alkanolamine-hydrochloride (Catalyst AC)[2].

PROCESSING PROCEDURE———The resin-forming monomer, which is also a crosslinking agent, was first dissolved in water at room temperature, and then the acid catalyst was added. In most cases the solutions were used within 10 minutes; in a few instances, where indicated, the solution containing formic acid was allowed to stand from one to four hours after the acid was added and before it was used. Where zinc nitrate or

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U S Department of Agriculture.

[2]Use of company and/or product named by the Department does not imply approval or recommendation of the product to the exclusion of others which may also be suitable.

alkanolamine-hydrochloride was used as latent acid catalyst to cure the trimethylolmelamine, a concentration of 1.75% catalyst (solids content) based on the weight of the resin was incorporated in the solutions. Samples of print cloth were impregnated on a laboratory padder to 80% wet take-up, dried four minutes at 80°C, and cured at the times and temperatures indicated below. Following the curing step, samples were washed at 100°F with Tide[a] as the detergent in a typical agitator-type home automatic machine. This wash was merely a step in the processing and does not represent the method used to launder the fabrics. The cloth samples were then tumbled dry in a gas-heated home dryer.

TEST METHODS——The following properties were determined by the usual ASTM procedures; breaking strength, strip method (*6a*) (except the strips were raveled to 80 threads); wrinkle resistance, Monsanto method (*6b*); and tear resistance, Elmendorf method (*6c*). Nitrogen was determined by the Kjeldahl method.

The damage due to retained chlorine was determined by the AATCC scorch test method (*7*).

The soap-sodium carbonate treatment consisted of boiling the samples of fabric for three hours in a solution of 0.5% standard soap (*8*) and 0.2% sodium carbonate, followed by rinsing and drying.

Portions of each of the fabrics were subjected to five launderings as described in AATCC test 14-53 (*9*).

The home laundry procedure used in this work was a rigorous wash carried out in an automatic washer at the hot-water setting (about 140°F) using Tide as the detergent. Conditions were those normally used for untreated cotton fabrics or garments.

RESULTS AND DISCUSSION

EFFECT OF DIFFERENT CURING TEMPERATURES AND TIMES ON WRINKLE-RECOVERY ANGLES——In previous work at this Laboratory (*1*), it was found that the fresh formic acid colloid could be cured in print cloth adequately at 140°C for four minutes to provide a high degree of rot resistance. A companion study was made to establish the minimum cure conditions needed for optimum wrinkle resistance and durability. In this study, fabric was treated with an acid colloid solution containing 10.3% methylolmelamine and 11.9% formic acid (a molar ratio of about 1:5) to give approximately 7% resin add-on, which is in the range or just slightly higher than that used with many other resin finishes but is at the same level recommended for methylolmelamine. Curing temperatures starting at 130°C and increasing in increments of 10° up to 160°C, and curing times of one, two, three and four minutes, were investigated. Figure 1 shows graphically the wrinkle-recovery angles for each period of curing time at the various temperatures. These curves indicate that a temperature of 140°C and curing time of at least two minutes imparted about the maximum wrinkle-recovery angles. The curves for the other curing times are essentially the same with only slight variations in wrinkle-recovery angles at the various temperatures. These results would indicate that curing temperatures are not critical except perhaps when a curing time of less than two minutes is used.

The same samples were carried through 20 home laundering and drying cycles. The wrinkle-recovery angles at the various curing temperatures and curing

[a]Use of company and/or product named by the Department does not imply approval or recommendation of the product to the exclusion of others which may also be suitable.

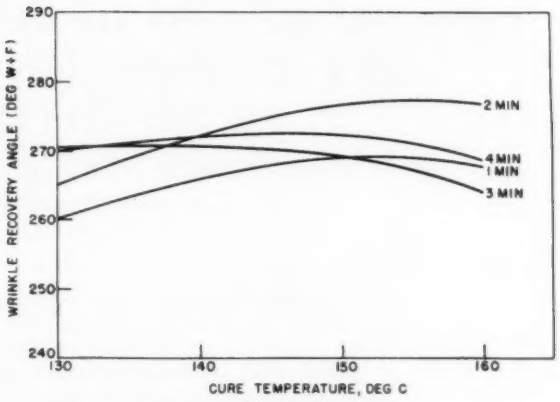

Figure 1
Effect of curing conditions on wrinkle-recovery angle

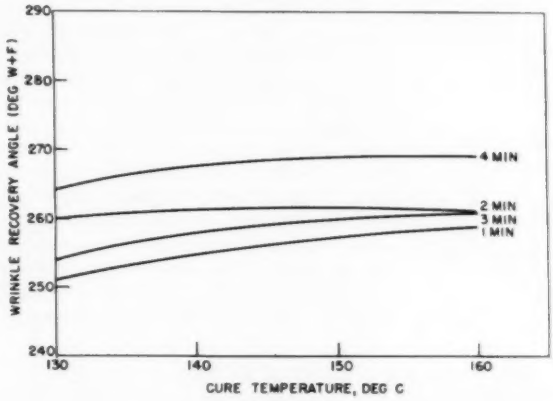

Figure 2
Effect of curing conditions on wrinkle recovery after 20 home launderings

times are shown in Figure 2. It is evident from these curves that the wrinkle-recovery angles are very similar for the various temperatures and times. The four-minute curing time produced fabric with slightly higher recovery angles. However, the differences in recovery angles are slight and could possibly be caused by fabric variations or testing technique. The most important point illustrated by this was that the acid colloid finish, over a wide range of curing conditions, is durable and maintains good wrinkle-recovery angles at least through 20 home launderings.

EFFECT OF CURING CONDITIONS ON BREAKING STRENGTHS OF ACID COLLOID-TREATED COTTON FABRIC——The warp breaking strengths of the acid colloid-finished samples cured at various temperatures for one, two, three, and four minutes are shown in Table I. The data show that varying curing temperatures and times imparted about the same breaking strengths. The fabrics had about a 30% strength loss, which is in the same range as most resin finishes. These values also indicate that curing conditions are not critical for the acid colloid finish.

Laundering by the home and AATCC methods caused all finished fabrics to gain strength compared with the original treated fabrics. This gain in strength is probably due to the removal of a small amount of surface resin, which partially immobilizes fibers and yarn.

These finished fabrics before laundering had tear strength losses of approximately 45 percent (without

TABLE I
Effect of curing conditions on breaking strength

Curing conditions Temperature (°C)	Time (min)	Warp breaking strength, pounds — Original fabric	After 20 home launderings	After five AATCC launderings
130	1	31.5	40.9	40.2
"	2	30.1	41.0	40.4
"	3	33.9	38.3	40.1
"	4	32.5	39.4	39.0
140	1	32.4	39.5	38.9
"	2	30.5	38.0	36.8
"	3	32.5	37.0	38.2
"	4	29.4	34.9	36.5
150	1	30.1	40.7	39.7
"	2	34.5	35.1	38.3
"	3	28.7	33.8	38.9
"	4	31.9	38.4	38.0
160	1	33.6	35.8	36.0
"	2	32.9	36.3	37.5
"	3	28.1	37.3	45.7
"	4	32.8	37.4	37.4
Untreated		47.3	47.9	46.1

TABLE II
Resistance to chlorine scorch damage of acid colloid-finished cloth

Curing conditions Temperature (°C)	Time (min)	Breaking strength retained, % — Original fabric	After 20 home launderings	After five AATCC launderings
130	1	72	64	93
"	2	85	78	91
"	3	84	81	92
"	4	100	82	70
140	1	91	59	72
"	2	100	68	79
"	3	90	95	95
"	4	100	88	95
150	1	100	79	88
"	2	91	85	100
"	3	100	86	85
"	4	98	71	76
160	1	80	79	100
"	2	99	87	88
"	3	88	90	77
"	4	94	70	89
Untreated		100	98	100

TABLE III
Wrinkle-recovery angles of print cloth finished with trimethylolmelamine by the acid colloid and conventional techniques

Finish	Resin add-on (%*)	Wrinkle-recovery angles (degrees W+F) Original	Wash and tumble-dry cycles 1	5	10
Acid colloid	2	238	205	205	199
" "	4	276	252	249	245
" "	7	294	278	261	260
" "	9	301	294	277	276
" "	12	305	290	285	287
Conventional	10	257	217	217	228
Conventional	7	236	—	237	241

*All samples were cured four minutes at 140°C.

added softener or lubricant), which is in the same range as fabric treated in the conventional manner. The different curing times and temperatures had little effect on tearing strengths as all results were essentially the same.

Nitrogen determinations were made on the original finished fabrics and after laundering by the two different methods. After 20 home launderings the fabrics retained essentially all their nitrogen content, and after five AATCC launderings the samples retained approximately 93 percent of their original nitrogen content. According to the data above, it appears that optimum fabric performance and durability can be obtained by curing for four minutes at 140°C.

RESISTANCE TO CHLORINE SCORCH DAMAGE OF ACID COLLOID-FINISHED FABRIC——In Table II are given the percent breaking strength retentions after the chlorine scorch test with the acid colloid-finished fabric cured at different temperatures and times, before and after 20 home launderings and after five AATCC launderings. It can be seen that the scorch test caused slight strength damage to the various finished fabrics. At a temperature of 130°C, it is necessary to cure for two minutes or longer to obtain good resistance to scorch damage. After 20 home launderings, the data indicate that, at the lower curing temperatures, the curing time should be more than two minutes to have acceptable strength retentions after a scorch test. After five AATCC launderings the percent breaking strength retentions were a little erratic in comparing the different curing temperatures and various curing times. However, the overall results indicate that the acid colloid finish has good resistance to chlorine scorch damage even after laundering.

FINISHING WITH FORMIC ACID COLLOIDS OF METHYLOLMELAMINE AT VARIOUS ADD-ONS——Fabric samples were treated with freshly prepared formic acid colloids of methylolmelamine to give resin add-ons ranging from 2% to 12%. The treating solutions contained 20% formic acid and sufficient methylolmelamine to give the various resin add-ons. For comparative purposes, fabrics were finished by a conventional process using alkanolamine hydrochloride as the latent catalyst. These fabrics had resin add-ons of 7% and 10%. In all cases the fabrics were dried four minutes at 80°C and cured four minutes at 140°C. It should be noted that in all cases the hand of colloid-finished fabrics is slightly more crisp than for fabrics finished with trimethylolmelamine using a latent acid catalyst. Due to the crisping effect of the colloid finish, slightly lower add-ons should be used for more densely woven fabrics.

Table III gives the wrinkle-recovery angles on these fabrics originally and after one, five, and 10 washing and tumble-drying cycles. The wrinkle-recovery angles for the acid colloid-finished samples containing 4% or more resin add-on ranged from 276° (W+F) to 305° (W+F), compared with a value of 257° (W+F) for the cloth containing 10% resin add-on finished in the conventional manner. Even after 10 home launderings the acid colloid-treated samples had good recovery angles and remained essentially wrinkle-free. The low wrinkle-recovery angles of the conventionally finished fabric after washing indicate that a curing temperature of 140°C for four minutes is not adequate when alkanolamine-hydrochloride is used as the latent acid catalyst.

EFFECT OF AGING OF COLLOIDS ON CREASE-RECOVERY ANGLES——As stated above, previous investigators had shown that aged acid colloid solutions did not impart wrinkle-recovery properties to cotton fabrics. It seemed desirable to determine whether aging of the present colloid solutions for a few hours would show any significant differences in recovery angles. This would be important to textile finishing plants in considering large-scale applications. A solution was prepared containing 10.3% methylolmelamine and 20% formic acid, which gave a 7% resin add-on. This level of resin imparted a pleasing hand to the fabric and excellent wrinkle and muss resistance. A portion of the solution was used immediately to finish print cloth, and other portions were used at one, two three, and four hours after the colloid solution had been prepared. In all cases the cure was four minutes at 140°C. Table IV shows the wrinkle-recovery angles of these samples as treated and after one, five, and 10 home

TABLE IV

Effect of aging of colloids on crease-recovery angles

Resin add-on 7%	Wrinkle-recovery angles (degrees W+F)			
		Wash and tumble-dry cycles		
	Original	1	5	10
0 Hour	281	275	246	260
1 "	284	271	251	249
2 "	288	278	249	264
3 "	274	264	249	260
4 "	282	271	249	248

launderings. The wrinkle-recovery angles indicate that aging of the acid colloid solution up to four hours imparted to cotton fabric satisfactory wrinkle-recovery angles. With this elapse in time between preparation and use there should be no problems to the textile industry in large-scale applications.

USE OF OTHER ACIDS TO PRODUCE A COLLOID———In a recent study by Nuessle and coworkers (*10*), it was shown that the presence of formate influenced the development of fish odor in resin-treated cotton fabrics. Although this odor had not been detected in this present work, where fabrics were washed thoroughly after resin application, investigations were conducted to determine if other acids would also produce stable colloids with trimethylolmelamine, and if such colloids could be used to impart the degree of "wash-wear" properties obtained with formic acid. The acids lactic, hydrochloric, glycolic, phosphoric, oxalic, citric, and crotonic were incorporated in the methylolmelamine solutions in the same manner as had been used with formic acid. The time required for a precipitate or gel to occur was noted. In all cases, except the solution containing lactic acid, a precipitate or gel began to form after the solutions had stood from 20 minutes to two hours. The lactic acid did form a solution which was stable for approximately eight hours. Therefore, fabric samples were treated with the lactic acid colloid of methylolmelamine. These had much lower wrinkle-recovery angles than did fabrics treated with the formic acid colloid and by the conventional manner.

WRINKLE RECOVERIES OF FABRICS TREATED WITH THE ACID COLLOID FINISH AND BY CONVENTIONAL TECHNIQUES———The previous discussions were concerned with fabrics finished with the formic acid colloid of methylolmelamine cured at different temperatures and at various times. It seemed desirable to compare wrinkle-recovery angles of fabric finished by the acid-colloid technique, and by the conventional manner using alkanolamine-hydrochloride and zinc nitrate at two different curing temperatures as the catalysts. The fabrics were finished by the four methods to obtain 7% resin add-on. All treated fabrics were dried at 80°C for four minutes. Three series of fabrics treated by the acid-colloid technique and by the conventional manner with alkanolamine-hydrochloride, and zinc nitrate were cured four minutes at 140°C for comparison purposes. The fourth series of fabric treated with zinc nitrate was cured four minutes at 150°C, as this temperature is generally required to produce adequate curing of trimethylolmelamine with latent acid catalysts. Figure 3 shows the wrinkle-recovery angles of these fabrics as treated, and after 20 home launderings, five AATCC launderings, and a three-hour soap-soda boil. At the 140°C curing condition, the acid colloid-treated fabric had much higher wrinkle-recovery angles than the fabrics treated in the conventional manner using latent acid catalyst. The zinc nitrate catalyst imparted higher wrinkle recoveries than did

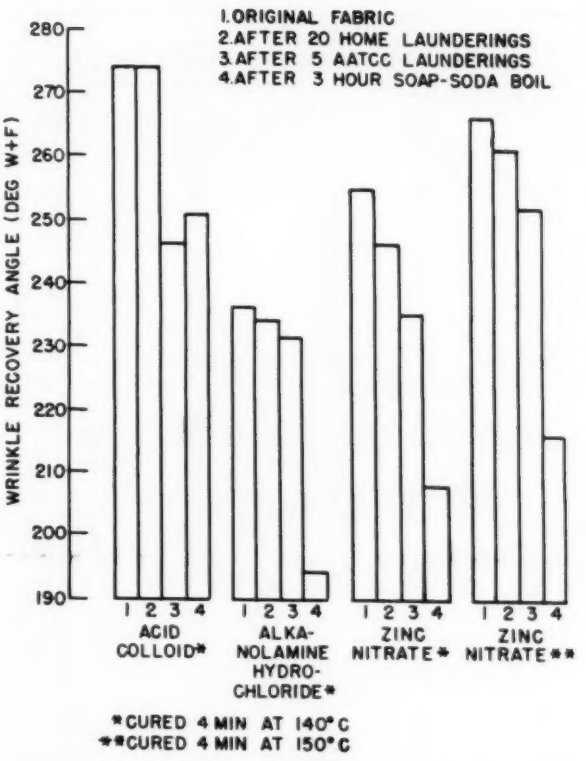

Figure 3

Wrinkle recoveries of fabrics treated with the acid colloid finish and by the conventional technique using alkanolamine hydrochloride and zinc nitrate catalysts

the alkanolamine-hydrochloride catalyst at this specific curing temperature.

Wrinkle recoveries of the fabric treated by the conventional manner using zinc nitrate as the catalyst and cured at 150°C were also lower than wrinkle recoveries of the acid colloid-finished fabric cured at 140°C, but were higher than values obtained by the same conventionally treated fabric cured at the lower temperature. In general, the data indicate that the acid colloid finish is more durable to laundering, and particularly when subjected to an alkaline wash.

The above fabrics were given a chlorine bleach and scorch test before and after 20 home launderings or five AATCC launderings. Breaking strengths showed that the acid colloid-finished fabric had retained practically all of its strength, even after laundering. The fabrics finished in the conventional manner had much less resistance to the chlorine wash and scorch test, before and after the two laundering methods. The acid colloid-finished print cloth yellowed slightly from the chlorine wash, while the conventional methylolmelamine-finished cotton yellowed considerably.

MICROSCOPICAL EXAMINATION OF ACID COLLOID-FINISHED COTTON———Microscopical observations were made on fibers treated with the formic acid colloid of methylolmelamine by examination of cross sections of fibers stained with CI Acid Blue 1 (CI 42045) and by treating ultra-thin sections with cupriethylenediamine hydroxide. The resin was deposited primarily in the outer portion of the cotton fiber to a depth approximating 25% of the fiber diameter. The

(*concluded on page 36*)

FORMIC ACID COLLOID OF METHYLOLMELAMINE RESIN FINISH OF COTTON FOR WRINKLE- AND MUSS-RESISTANCE: PRELIMINARY COST STUDY

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Investment and operating costs for a hypothetical plant are reported for the application of the formic acid colloid of methylolmelamine resin finish to cotton to impart wrinkle- and muss-resistance.

The cost study is based on finishing 80 x 80 cotton print cloth, 50 inches wide, 3.12 linear yards per pound, to a seven percent resin add-on, by continuous operations in a hypothetical plant, at a processing rate of 120 yards per minute. It is estimated that processing cost ranges from 3.7 cents per linear yard at an annual production of 60.5 million yards to 5.1 cents per linear yard at an annual production of 14.4 million yards. Alternatively expressed, the costs range from 2.7 to 3.7 cents per square yard, or from 10.8 to 14.8 cents per pound of product. These costs are exclusive of the cost of cotton used and are for custom processing without profit. This inexpensive finish can be applied by continuous processing in conventional textile equipment.

The importance of wrinkle resistance as a consumer quality requirement is also reported.

INTRODUCTION

THE application of methylolmelamine resins to cotton using the formic acid colloid technique developed at the Southern Regional Research Laboratory has been reported by Berard, et al (*2, 3*). This technique, more technically referred to as the formic acid colloid of methylolmelamine resin finish, is so called because formic acid is used in the treatment solution both to produce a colloid comprised of methylolmelamine molecules and polymers of trimethylolmelamine associated and stabilized by polar acid groups, and to serve as a catalyst.

The process is not only conventional, consisting of padding, dyeing and curing, but it is also versatile in that variation of the composition of the treatment solution and of resin add-on produces cotton products exhibiting differing desirable quality characteristics for various end uses. Investment and processing costs have been reported (*7*) for producing in a single treatment rot- and weather-resistant cotton having a 12 percent resin add-on by the application of an aqueous treatment solution containing 17 percent by weight trimethylolmelamine and 20 percent formic acid. In this paper estimated investment and processing costs are given for producing wrinkle- and muss-resistant cotton fabric by continuous operations in a hypothetical plant using the formic acid technique.

Cotton fabrics finished to a seven percent resin add-on by this technique have good wrinkle- and muss-resistance, maintaining good crease angles at least through twenty home launderings; yellow only slightly when exposed to hypochlorite bleach in comparison with considerable yellowing of conventional methylolmelamine-finished cotton; have no more than the usual 30 percent breaking strength loss effected by most resin finishes; before laundering, have tear strength losses of about 45 percent, which is in the same range as fabric treated in the conventional manner; and have good resistance to chlorine scorch damage even after repeated laundering.

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, United States Department of Agriculture.

THE PROCESS

The process for imparting durable wrinkle- and muss-resistance is illustrated in Figure 1. It reflects the processing conditions that have been determined by Berard, et al (*3*) to yield optimum fabric performance and durability. Of prime importance to the success of the finish is the fact that a freshly prepared acid colloid solution must be used, the time between preparation and application not to exceed four hours. However, this amount of time should not introduce a problem to the textile industry in large-scale applications.

In the hypothetical plant, desized, scoured, and bleached 80 × 80 cotton print cloth, 50 inches wide, 3.12 linear yards per pound, is padded through an aqueous solution of trimethylolmelamine and formic acid at a processing rate of 120 yards per minute, and squeezed to a wet pickup of 80 percent; dried in a forced-air roller-type drying oven for four minutes at a temperature of 80°C; cured in the same type oven for four minutes at 140°C; washed in hot and cold water in a continuous counter-flow open-width washing range; and dried on a tenter frame. The product contains seven percent resin add-on and possesses good wrinkle- and muss-resistance. Two treatment solutions are considered in this cost study, one containing 10.3 percent methylolmelamine, 11.9 percent formic acid (a molar ratio of about 1:5), and 77.8 percent water by weight; the other 10.3 percent methylolmelamine, 20 percent formic acid, and 69.7 percent water by weight. The former solution represents a concentration of five moles of formic acid to one mole of methyolmelamine, the minimum molar ratio of formic acid to methylolmelamine required.

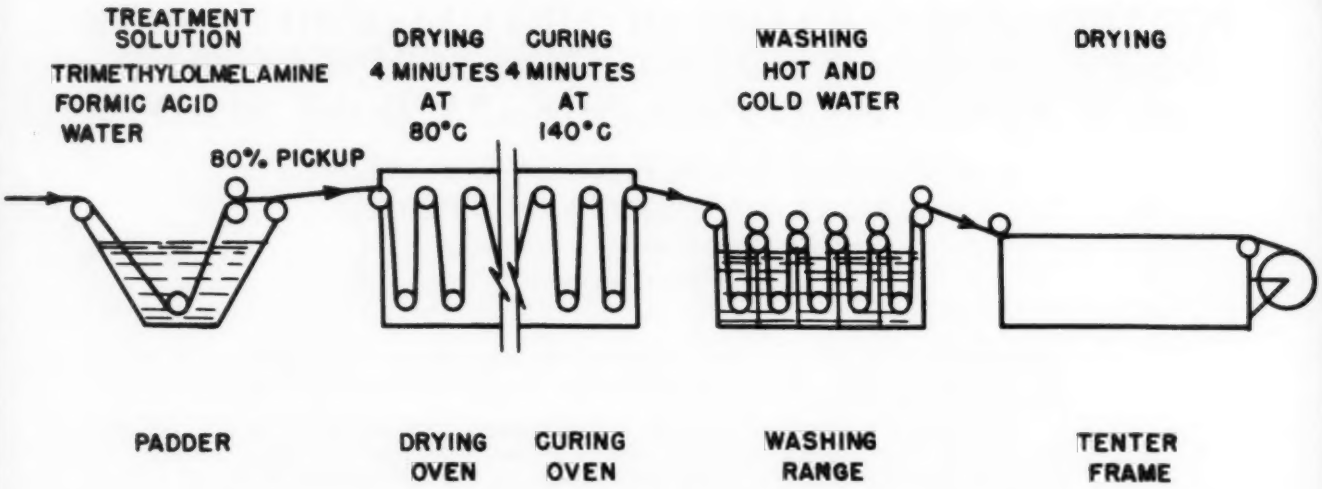

Figure 1
Continuous acid colloid methylolmelamine resin finish for cotton fabric

COSTS

Total plant cost is reported in Table I for a new hypothetical plant for finishing cotton fabric at a rate of 120 yard per minute and includes installed equipment, buildings, process piping, instrumentation, outside lines, steam boiler, engineering and construction, and contingencies costs. This cost is the same as that reported earlier (7) for finishing fabric to a resin add-on of 12 percent for rot- and weather-resistance using the formic acid colloid technique.

Installed equipment costs from which the total plant cost is derived are given in Table II. Percentages applied to the total installed equipment cost in estimating process piping, instrumentation, and outside lines, were selected from published information (*1, 4, 8, 9*). A steam boiler having a capacity of 35,000 pounds per hour of 60 psig steam is allowed.

A building is included having a steel frame, brick and concrete walls, and a concrete floor and roof. Both areas, manufacturing and warehouse, are provided with heating, lighting, and sprinklers. In addition, the manufacturing area has ventilation, sanitary plumbing, and chemical-resistant tile. Building cost was derived using a unit cost of $21.50 per square foot of floor area for the manufacturing area, and $8 per square foot for the warehouse area. Area requirements were estimated from equipment specifications, with provision for reasonable working space around the equipment.

Total processing costs are shown in Table III for the formic acid colloid finishing of 80 × 80 cotton print cloth, 50 inches wide, 3.12 linear yards per pound, to a seven percent resin add-on using an aqueous treatment solution containing 10.3 percent methylolmelamine, and

TABLE I
Continuous acid colloid methylolmelamine resin finish for cotton fabric for wrinkle-and muss-resistance[1]

	Total Plant Cost
a) Installed equipment	$ 575,156
b) Process piping (13% of "a")	74,770
c) Instrumentation (2% of "a")	11,503
d) Outside lines (3% of "a")	17,255
e) Steam boiler	80,000
f) Building	258,405
g) Physical plant cost	$1,017,089
h) Engineering and construction (20% of "g")	203,418
i) Contingencies (15% of "g")	152,563
j) Total plant cost	$1,373,070[2]

[1]80 x 80 cotton print cloth, 50" wide, 3.12 linear yards per pound, at rate of 120 yards per minute.
[2]This total plant cost is for a plant used for one-shift operation at an annual production of 14,400,000 yards. For operation of two or more shifts per day and annual productions up to 60,480,000 yards, additional raw material storage is necessary, and total plant cost is thereby increased to $1,403,332.

TABLE II
Formic acid colloid of methylolmelamine resin finish of cotton for wrinkle- and muss-resistance

No.	*Equipment*	*Installed cost*
1	padder, 316 ss	$ 6,258
1	480-yd roller dryer, ss faced rolls	126,224
1	480-yd roller curer, ss faced rolls	126,224
4	32-roll washing ranges, 304 ss	197,000
1	120-ft tenter frame	106,862
2	600-gallon mixing tanks, 316 ss	9,160
5	pumps with motors	3,428
	Installed equipment cost	$575,156

TABLE III
Continuous acid colloid methylolmelamine resin finish for cotton fabric for wrinkle- and muss-resistance, 7% resin add-on

	Total Processing Costs			
Annual Plant Capacity (1000 yds)	14,400	28,800	43,200	60,480
Annual Operation; days	250	250	250	350
Daily Operation; hours	8	16	24	24
	Cents/linear yard			
Direct expenses				
Chemicals	2.14	2.14	2.14	2.14
Labor	0.14	0.15	0.15	0.20
Supervision	0.01	0.02	0.02	0.02
Maintenance	0.33	0.17	0.11	0.08
Plant supplies	0.05	0.03	0.02	0.01
Utilities	0.22	0.22	0.22	0.22
Indirect expenses				
Payroll overhead	0.02	0.03	0.03	0.03
General plant overhead	0.12	0.08	0.07	0.07
Packaging cost	0.08	0.08	0.08	0.08
Fixed expenses				
Insurance	0.10	0.05	0.03	0.02
Property taxes	0.19	0.10	0.06	0.05
Depreciation	0.52	0.26	0.17	0.12
Contingencies	0.20	0.16	0.16	0.15
General expenses				
General admin & office overhead	0.12	0.11	0.10	0.10
Financing[1]	0.56	0.31	0.23	0.18
Sales	0.25	0.21	0.20	0.19
Total processing cost				
Cents/yard	5.1	4.1	3.8	3.7
Cents/pound product[2]	14.8	12.0	11.1	10.8

[1]Financing expense is estimated as 5% of the sum of total plant cost and working capital requirements.
[2]The product weight is 2.92 linear yards per pound with 7% resin add-on.

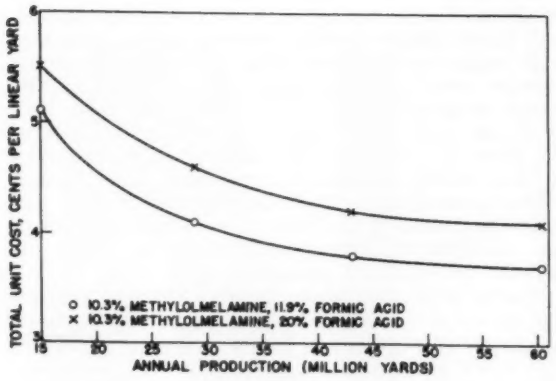
TOTAL UNIT COST, CENTS PER LINEAR YARD
o 10.3% METHYLOLMELAMINE, 11.9% FORMIC ACID
× 10.3% METHYLOLMELAMINE, 20% FORMIC ACID
ANNUAL PRODUCTION (MILLION YARDS)

Figure 2
Processing costs for formic acid colloid-methylolmelamine resin finish of cotton for wrinkle- and muss resistance, 7% add-on 80 x 80 fabric, 50 inches wide

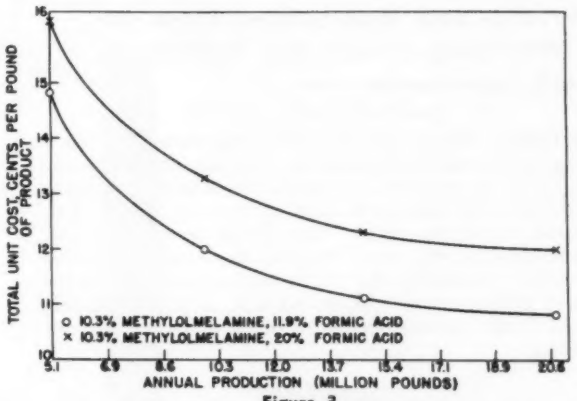
TOTAL UNIT COST, CENTS PER POUND OF PRODUCT
o 10.3% METHYLOLMELAMINE, 11.9% FORMIC ACID
× 10.3% METHYLOLMELAMINE, 20% FORMIC ACID
ANNUAL PRODUCTION (MILLION POUNDS)

Figure 3
Processing costs for formic acid colloid-methylolmelamine resin finish of cotton for wrinkle- and muss resistance, 7% add-on 80 x 80 fabric, 50 inches wide

11.9 percent formic acid (a molar ratio of about 1:5). Use of an aqueous treatment solution containing 10.3 percent methylolmelamine and 20.0 percent formic acid results at the various productions in total processing costs which are 0.4 cents per linear yard higher than those in Table III. Processing costs for treatment with each solution are plotted in Figures 2 and 3.

Total processing costs in Table III range from 5.1 cents per yard at an annual production of 14.4 million yards to 3.7 cents per yard at an annual production of 60.5 million yards. Alternatively expressed, the costs range from 3.7 to 2.7 cents per square yard and from 14.8 to 10.8 cents per pound of product. These costs are exclusive of the cost of cotton used and are for custom processing without profit.

Chemical costs for 100 pounds of cotton treated and per yard of 80 × 80 cotton print cloth, 50 inches wide, using a solution of 1 to 5 molar ratio are given in Table IV.

Labor costs are estimated as those applicable to a textile finishing plant, with skilled labor at $2.35 per hour and semiskilled labor at $1.62 per hour. Double time is used for weekend work and a ten percent night labor differential is used for second- and third-shift operations.

Utility costs include those for steam, electricity, and process water. Unit costs used are 70 cents per 1000 pounds of steam; one cent per kilowatt-hour of electricity; and 25 cents per 1000 gallons of water.

Because the process can be accomplished in the usual equipment for resin finishing, these processing costs would apply to the formic acid colloid treatment of 80 × 80 print cloth to seven percent resin add-on that might be done at a rate of 120 yards per minute intermittently with other chemical processings in the same equipment at combined annual production rates equivalent to those specified. Since the processing costs are based on a new installation, they could be less by as much as the depreciation cost in plants having fully depreciated equipment of the type needed. Depreciation cost represents about 65 percent of fixed cost.

TABLE IV
Chemical costs per 100 pounds of cotton treated

Chemical	*Weight (pounds)*	*Price (cents/lb)*	*Cost (dollars)*
Methylolmelamine	8.24	60.25	$4.96
Formic acid (90% purity)	10.58	16.25	1.72[1]
			$6.68
Per yard			2.14 cents

[1]It may be possible to reduce this cost by recovery of vapors from dryer. However, this has not been done.

DEMAND AND USES

Wrinkle resistance is a consumer quality requirement in products for which more than 2.6 billion pounds of cotton and other fibers are used annually (5). Approximately 50 percent of the annual domestic consumption of cotton broad woven fabric is in uses in which consumers want "easy-care" qualities, and cotton accounts for 75 percent of the consumption of all woven fabrics consumed in these applications. In 1959 more than two billion square yards of woven cotton fabrics were resin-finished for the "easy-care" market (6).

SUMMARY

The formic acid colloid of methylolmelamine resin finish of cotton for wrinkle- and muss-resistance is estimated to cost between 3.7 and 5.1 cents per yard of 50-inch 80 × 80 print cloth under the conditions prescribed in this preliminary cost study. Alternatively expressed, the costs range from 2.7 to 3.7 cents per square yard. This inexpensive finish can be applied by continuous processing in conventional textile equipment.

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Wrinkle- and Muss-resistant Finish for Cotton Using Formic Acid Colloid of Methylolmelamine———

(*concluded from page 32*)

innermost section of the fiber responded to cupriethylenediamine hydroxide in a manner similar to that observed for cotton having small amounts of crosslinked cellulose. In examination of the conventionally processed fabric, the fibers were found to be uniformly penetrated by the resin. Whether the excellent wrinkle recovery obtained is due to the nitrogenous resin in the outer portion of the cotton cell wall or to other crosslinks in the central portion of the fiber, or both, is not known.

SUMMARY

Cotton fabric was made wrinkle- and muss-resistant by treating with a freshly prepared formic acid colloid of methylolmelamine at about 7% resin add-on. The hand of the fabric was slightly crisp. The finishing process consisted of the usual pad, dry, and cure procedure. Fabric treated with colloidal solutions that were allowed to age up to four hours had about the same degree of wrinkle recovery as did fabric treated with acid colloids which were used immediately after preparation. However, according to prior work, similar acid colloids aged at least 12 hours, and as long as 24 hours, did not impart wrinkle resistance to cotton fabrics.

Suitable acid colloids were obtained when the colloidal solutions contained as much as one mole of methylolmelamine and five moles of formic acid; larger amounts of formic acid also gave satisfactory results. It was shown that colloidal solutions prepared with a number of other acids were not as good for this purpose as formic acid.

Different curing temperatures and times had only a slight effect on wrinkle-recovery angles, breaking strengths, and chlorine wash and scorch damage, even after 20 home launderings and five AATCC launderings. A cure at 140°C for four minutes is about the minimum for a completely satisfactory cure. Nitrogen determinations before and after the various launderings showed there were no losses in resin content, indicating excellent durability of the acid colloid finish.

Fabric treated with methyolmelamine by the acid-colloid technique, and cured at 140°C for four minutes, had much higher wrinkle-recovery angles compared with angles of the cloth finished in the conventional manner using two latent acid catalysts, after two different launderings and a three-hour soap-soda boil. Thus, the acid colloid finish cures more thoroughly at the lower temperature. The acid colloid-finished fabric was resistant to chlorine wash and scorch damage, retaining practically all of its breaking strength, and yellowing just slightly, while the fabrics finished in the conventional manner showed greater losses in strength and yellowed substantially.

Microscopical observations on fibers finished with the acid colloid of methylolmelamine showed that the resin was deposited primarily in the outer portion of the cell wall of the cotton fiber, and the innermost section responded to cupriethylenediamine hydroxide treatment in a manner similar to that observed for cotton having small amounts of crosslinked cellulose.

Acid colloid-treated fabrics yellowed less when exposed to hypochlorite bleach than fabric treated by the conventional pad, dry and cure technique using a latent acid catalyst. However, the yellowing of the acid colloid-treated fabric was definitely noticeable and therefore this finish is not recommended for white goods.

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"Effect of Yarn Twist and Fabric Cover Factor on Crease Recovery and Tear Strength"———P C Mehta, Ahmedabad Textile Industry's Research Association

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STUDENT CHAPTERS

Auburn University, Bradford Durfee College of Technology, Clemson College, Georgia Institute of Technology, Lowell Technological Institute, New Bedford Institute of Technology, North Carolina State College, Philadelphia College of Textiles and Science

New England Regional Meeting———

FABRICS LAMINATED TO URETHANE FOAM*

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INTRODUCTION

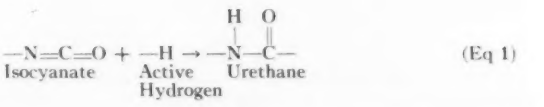
ABOUT three years ago, the first garments to be made from a material consisting of fabric laminated to urethane foam came into being. The rapid success of these laminates is evident from a recent estimate which claims that about one million yards will be used in 1961. Many of the fabrics which have been enthusiastically received as laminates had been available for many years, but they were not used in an unlaminated state because they were too thin or easily distorted. The foam makes fabrics dimensionally stable and the textile component compensates for the low tensile strength and poor abrasion resistance of the foam.

When laminated to urethane foam, the fabric is the surface of the material. In contrast, leatherlike materials have as their surface a vinyl film or foam, which is laminated to a knitted cotton or nylon jersey. The vinyl laminates have largely replaced textile materials in automobile upholstery. Recent developments in vinyl foam have stimulated their use in garments. Urethane and vinyl laminates have some shortcomings, but considerable research work is being done to improve these products and their further expansion into textiles is certain.

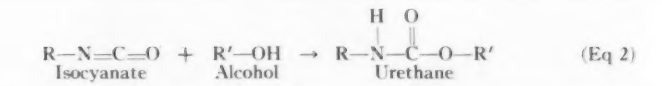
The chemical and physical properties of urethane foams are adequately described in the literature (*2, 8, 9, 10*) and similar information on textile fabrics is available (*11, 12*). No similar quantitative data have been published for the combination of polyurethane foam with textile fabrics, and it is the purpose of this paper to compare the laminated material with conventional textile fabrics.

DISCUSSION

CHEMISTRY, FOAM MANUFACTURING, AND LAMINATING——— Chemicals used for manufacturing polyurethane foam can be varied depending on the end-use requirements.



(Eq 1)



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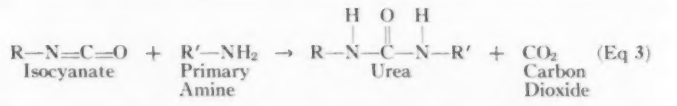

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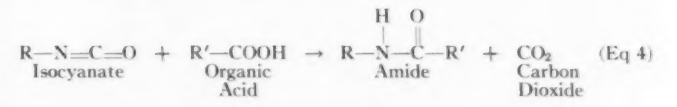

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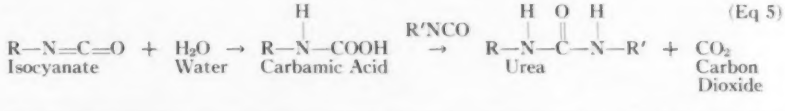
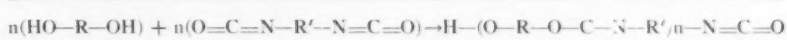


(Eq 5)



(Eq 6)

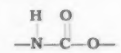
For garments, a diisocyanate is reacted with polyesters to form a foam which is soft, resilient, washable, drycleanable, and easily laminated.

The basic urethane reaction shown in Equation 1 is the reaction of an isocyanate with a compound containing active hydrogen, as in water, alcohol, amines, acids, and amides. Equations 2, 3, 4, & 5 show the chemical reactions in their simplest form. Each of the reaction products still contains active hydrogen atoms capable of further reactions with isocyanates.

Diisocyanate reacting with polyester to form a linear polymer is shown in Equation 6. Cross-linked structures are obtained when the "R groups" shown in Equation 6 contain additional active hydrogen atoms.

The chemical materials, catalysts, and the conditions of the reaction affect the density of the foam, the size of the cells, and the cell wall structure. These in turn influence the mechanical properties of the foam.

It is interesting to note that urethanes are made into textile fibers to form rubber-like spandex yarns. The urethane linkage



is similar to the amide linkage

present in nylon. The additional oxygen in the urethane linkage probably accounts for the flexibility and elasticity of urethane fibers.

The foam is usually made continuously and cut into large blocks. The blocks are sliced or then "peeled" into long sheets about 3/32" thick, just as veneer is cut from a rotating log. The usual foam thickness is 3/32", but this may be varied. For example, "spring weight" fabrics use 5/64" foam.

Ideally a lamination process should give a flexible fabric having a permanent bond which withstands washing

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TABLE I
Fabric samples studied

Sample No.	Construction	Fiber Content	Weight (oz/yd²) Greige	Laminated
1A	Bulky-knit half cardigan	cotton	20.5	17.4
1B	" " "	"	16.9	15.5
1C	" " "	"	14.6	11.4
2A	Knit half cardigan	"	9.8	10.0
2B	" " "	"	7.9	9.1
2C	" " "	"	5.5	6.6
3A	Bulky-knit half cardigan	wool	15.7	14.7
3B	" " "	"	10.4	9.7
4	Knit, jersey	80%-20% Orlon-wool	—	5.8
1B'	Sample 1B laminated to sample 4		—	19.8
5	Woven sateen	cotton	7.4	9.2
6	Woven 80 square	"	7.2	9.0
Original foam only (.090")			2.11	
Foam delaminated from 80 square cotton			1.84	
Foam delaminated from 3B (.075")			1.75	

TABLE II
Percent change in area under a load of two kilos

Fabric	Change in area (%) Greige	Laminated
Bulky cotton half cardigan	14	4
Cotton half cardigan	26	8
Bulky wool half cardigan	14	8
Original foam only	3	
Foam delaminated from 80 square cotton	12	
Foam delaminated from bulky wool half cardigan	19	

and drycleaning. To date these requirements have been met by using the "flame-lamination" process. In this process the surface of the foam is heated, usually by a gas flame, until it becomes soft and tacky and is immediately bonded under pressure to the fabric. U S Patent 2,957,793 (*15*) describes a specific application of this general process as follows:

"A method of forming a laminate construction which method comprises heating a sheet of foamed polyurethane plastic material of the polyester type by contacting the same with a gas flame at the surface for a time sufficient to fuse a surface layer only and thereby to render substantially only such surface layer soft and tacky, and pressing a sheet of fabric material onto said soft and tacky layer after the latter has cooled to a temperature below the fusing temperature of the foamed polyurethane material."

During lamination, careful control is necessary in order to obtain a strong bond without at the same time "burning off" more than the usual 1/32" of foam. Excessive oil or other finishes on the fabric will decrease the strength of the bond.

Another method of lamination employs adhesives, which are usually applied to the surface of the foam to bond the fabric to the foam. In the past, the adhesives were not permanent to drycleaning nor were the laminated fabrics flexible. It has been reported that adhesives are now available which overcome these difficulties (*14*). A small amount of adhesive is less expensive than the 1/32" of foam lost in flame lamination, and with adhesives, thinner foams are used which cost correspondingly less. But exponents of flame lamination claim that foam is decreased in thickness even with adhesives and that there is little or no economy. A recent general review of knit laminates discusses these points (*14*).

Our observations suggest that bonding occurs during flame lamination by individual fibers being embedded in the softened foam. Indirect evidence for this is indicated by the fact that smooth fabrics frequently must be napped prior to lamination in order to obtain a strong bond.

Foam is creamy white in its natural state and is usually colored with pigments during foam formation to match fabric colors. Foam can also be printed or dyed. Lightfastness of foam is generally poor because the foam yellows, but in use the fabric shields the foam.

MATERIALS——Knitted cotton, wool and Orlon-wool fabrics covering a wide range of weights were prepared at Malden Mills while woven cotton sateen and 80 square were purchased. The knitted fabrics were tentered or calendered prior to lamination to make them conform with the desired width. The fabrics were bonded to foam which weighed about 1.8 lbs per cubic foot by the flame-lamination process. Tentering and lamination frequently stretch the fabric and decrease the weight per square yard so that the combined weight of fabric and foam in the laminated state is sometimes lower than the original greige cloth, as shown in Table I.

Within each group of fabrics shown in Table I, the weight was varied by changing the number of yarns per feed, but the large changes among the groups represent different knitting constructions and yarn sizes.

The weight of the foam after lamination was obtained from those samples where the foam could be stripped from the fabric. The percentage loss in weight of the foam as a result of laminating corresponds approximately to the percentage loss in thickness.

DIMENSIONAL STABILIZATION BY LAMINATION——The main reason for laminating a knitted fabric is to obtain a dimensionally stable material. In order to determine to what extent lamination actually does this, a device was employed which applies forces uniformly all around the perimeter of a circular piece of fabric (U S Testing Co shrinkage gauge). In this way a total force of about two kilos or 100 grams at each of 20 points was applied to the fabric and the change in area determined.

The average values for groups of fabrics are shown in Table II. It is apparent that the fabrics have been considerably stabilized by lamination. Actually, some of the data in Table II for the greige fabrics are misleading because the fabrics are stretched during lamination and are sometimes more stable than is shown.

Modification of the foam as a result of flame lamination is apparent in Table II. Original foam stretches about 3% in area, but foam which has been peeled from a laminated fabric stretches as much as 19% by the test described above. In spite of the flexibility of both foam and fabric, the laminated structure is a stable system.

Although the shrinkages during laundering of greige fabrics and laminated materials were compared, the results were erratic and only a few general statements can be made.

Foam does not shrink during laundering, but the laminated materials can shrink and the degree of shrinkage is a function of the fabric portion. Cotton, wool or rayon laminates will shrink unless the fabrics have been stabilized. Fabrics which are very light in weight are frequently stabilized by the foam.

Neither the fabrics nor the foam shrink during drycleaning and the combined structure is stable in this respect.

THERMAL TRANSMISSION——Schiefer (*1*) demonstrated that insulation is directly related to thickness of the fabric and is independent of the type of fiber. He gave the following relationship:

$$T = \frac{1}{3.0t + 0.63} \qquad \text{(Eq 7)}$$

where "T" is the thermal transmission expressed in BTU/F°/hr/ft² and "t" is the thickness of the fabric.

If one substitutes the quantity "one inch" for "t" in the denominator of this equation, the thermal transmission of a hypothetical fabric one inch thick is found to be 0.28. Hurd (*2*) reported a thermal transmission of 0.29 for one inch of foam weighing 2.5 lbs per cubic foot. Nopco Chemical Co reported (*10*) a thermal transmission of 0.28 for one inch of foam weighing 2.0 lbs per cubic foot. It is apparent that the thermal transmission values of foam and textile fabrics of the same thickness are identical. Since foam is generally thicker than most apparel fabrics, its contribution to insulation is greater than that of the fabric.

THICKNESS——Generally thick fabrics are low in density and readily compressible. Pile fabrics (*13*), napped materials, quilted structures and foam are examples. Comparison of apparel fabrics for thickness should take place under conditions simulating wear and a pressure of 1.0 psi has been suggested (*3*).

Thickness values of the test fabrics at essentially "zero" load (.053 lbs/in²) and at approximately 1.0 psi are shown in Table III. Using the thickness values for the delaminated foam, the unbroken straight line shown in Figure 1 was obtained. The broken line in Figure 1 represents typical data (*1*) for wool blankets. A comparison of the two lines indicates that foam is less dense than a wool blanket even at a pressure of 1.0 psi. Laminated knit cotton fabrics are similar to wool blankets in thickness while wool laminates are less dense. The two points at the bottom of Figure 1 show that conventional unlaminated fabrics are much more dense than the laminated materials.

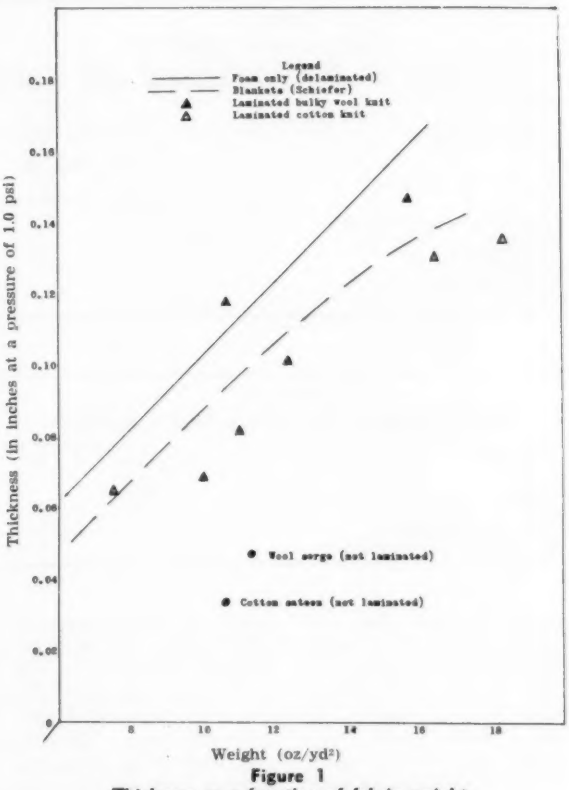

Figure 1
Thickness as a function of fabric weight

The excellent insulating properties of laminated fabrics, as suggested by their thickness, have been generally substantiated in use; but in some cases coats made from thin jersey laminates, lined with a thin fabric, have been sold enthusiastically, if unrealistically, as suitable for winter wear in the northern part of our country.

AIR PERMEABILITY——Apparel fabrics should transfer water vapor or "breathe". Pierce (*5*) demonstrated that fabrics composed of hydrophilic fibers transfer water vapor even when the weave is extremely tight, but in fabrics consisting of hydrophobic fibers the water vapor will migrate through the fabric interstices only. Fourt and Harris (*4*) demonstrated that materials of low density generally have a high air permeability and good water vapor transfer. Since polyurethane foam is a hydrophobic material, it is of interest to determine whether its air permeability is great enough to permit adequate water vapor transfer.

The range of air-permeability values can be very broad, as shown in Table IV for some typical fabrics (*6*), and in Table V for the laminated fabrics. While the data in Table IV

TABLE III
Thickness of laminated fabric and foam

Fabric	*Weight of laminated fabric* (oz/yd²)	*Thickness (inches)* (at .053 lbs/in²)	*Thickness (inches)* (at 0.955 lbs/in²)
Knit half cardigan, cotton	17.4	0.182	0.126
" " " "	15.5	.183	.121
" " " "	11.4	.144	.092
" " " "	10.1	.091	.073
" " " "	9.1	.087	.060
" " " "	6.6	.075	.056
" " " wool	14.7	.240	.137
" " " "	9.7	.201	.109
Knit jersey, Orlon-wool	5.8	.078	.046
Sandwich laminate	19.8	.184	.131
Woven sateen, cotton	9.2	.066	.044
Woven 80 square, cotton	9.0	.077	.037
Original foam only	2.11	.090	.025
Foam only, delaminated from 80 square	1.84	.068	.017
Foam only, delaminated from wool bulky	1.75	.074	.018

TABLE IV

Fabric	*Air permeability (Fourt & Harris)* (ft³/ft²/min at 0.5" water pressure)
Mosquito net	1300
Knit cotton undershirt	220
Palm Beach suit	160
8.2-oz Army uniform	12

TABLE V
Air permeability of laminated fabrics

Fabric	*Weight* (oz/yd^2)	*Air permeability* ($ft^3/ft^2/min$ at 0.5" water pressure)
Bulky cotton half cardigan	17.4	81
" " " "	15.5	140
" " " "	11.4	184
Cotton half cardigan	10.0	82
" " "	9.1	161
" " "	6.6	14.5
Bulky wool half cardigan	14.7	290
" " " "	9.7	360
Knit jersey	5.8	111
Sandwich laminate	19.8	76
Woven cotton sateen	9.2	36
Woven cotton 80 square	9.0	64
Original foam 3/32" not lam	2.1	59

TABLE VI
Air permeability of foam

	Weight (oz/yd^2)	*Thickness* (*inches*)	*Air permeability* ($ft^3/ft^2/min$ at 0.5" water pressure)
Original foam	2.11	0.90	59
Flamed foam (not laminated)	1.96	.80	102
Foam delaminated from wool bulky knit	1.75	.75	486

TABLE VII
Actual and calculated air permeability (bulky wool half cardigan)

	Air permeability ($ft^3/ft^2/min$ at 0.5" water pressure)	
	Sample 3A	*Sample 3B*
Fabric only, delaminated	360	565
Foam only, delaminated	532	439
Laminated structure, actual	290	360
Laminated structure, calculated from Equation 8	215	247

TABLE VIII
Compressional resiliency

Fabric	*Compressional resiliency (%)* — *Fabric only*	*Lam fabric*
Foam only	44	
Bulky cotton half cardigan 1A	40	44
" " " " 1C	43	46
" wool half cardigan 3A	52	48
" " " " 3B	52	48
Wool blankets, average (Schiefer)	50	—

are "reasonable", those in Table V are puzzling because of the very high air permeability of some of the laminated materials. One would expect that the air permeability of a laminate should be at least as low as that of its most impermeable portion, specifically lower than 59, the value for the foam alone. The explanation, however, lies in the large increase in air permeability of the foam as a result of lamination, as shown in Table VI.

Examination of foam delaminated from fabric suggests that the increase in air permeability is a result of enlargement of the "pores" in the foam. This hypothesis is upheld by Poiseiulles equation:

$$V = \frac{\pi (P_1 - P_2) r^4}{8 \eta L} \qquad \text{(Eq 8)}$$

where "V" is the volume of gas flowing through a capillary in unit time; the difference in pressure between the inlet and outlet side of the capillary is P_1-P_2; "r" is the radius of the capillary; " η " is the viscosity of the gas; and "L" is the length of the capillary. Since the radius is raised to the fourth power, a small change in diameter will result in a very large change in volume of gas flowing through the pore.

The wool bulky knit fabrics were delaminated from the foam and air permeability values of foam and fabric separately determined. With these data it is possible to test the hypothesis that fabric and foam act as resistances placed in series, analogous to electrical circuits.

If the reciprocal of air permeability represents resistance, then

$$\frac{1}{P_{\text{fabric}}} + \frac{1}{P_{\text{foam}}} = \frac{1}{P_{\text{laminate}}} \qquad \text{(Eq 9)}$$

where P is the air permeability.

Calculated values of air permeability of the laminated structure were obtained with the above equation, and are compared with the actual values shown in Table VII. The former are lower than the latter, suggesting that turbulence of the air at the surfaces of these materials decreases the air permeability; the laminated structure has two surfaces while the foam and fabric separately represent a total of four surfaces.

The air permeability of knitted laminated fabrics is obviously large enough to permit transfer of water vapor. Is it so high that thermal insulation is impaired? It is known that thickness is much more important than air permeability for thermal insulation, even at high wind velocities; at low temperatures air permeability becomes even less important.

COMPRESSIONAL RESILIENCY ——— Although thickness values given in Table III demonstrate that the foam is easily compressible, published data (*8, 9, 10*) indicate that polyester urethane foam recovers rapidly from compression. Is the laminated structure equally good?

Compression and recovery curves were obtained by the use of the Instron tester adapted for this purpose, the total load being 2.0 psi. The actual recovery in thickness was practically immediate and complete. While the recovery in thickness is one indication of resiliency, a more satisfactory measure is that obtained from the ratio of work recovered to work expended in compression and is known as "compressional resiliency". This has been found to be a reliable indication of the recovery properties of textile materials.

The compressional resiliency of wool blankets was found to average about 50% by Schiefer (*1*). When laminated, the compressional resiliency of cotton is increased and wool decreased so that both are close to the values for wool blankets, as shown in Table VIII.

STRENGTH AND ABRASION RESISTANCE———A strip of foam one inch wide and 0.1" thick has a breaking strength of 2.5 to 3.0 lbs, but this very low value is compensated for by lamination to a fabric. The same comment can be made regarding tear strength. It should further be explained that lamination to foam does not immobilize the yarns of the fabric and cause a decrease in tear strength as occurs in some coated fabrics (*7*).

Abrasion resistance was not measured, but experience of the past few years has shown that, in general, the foam improves the durability of the fabric. The mechanism may be similar to the effect of a rug underlay, which distributes the abrasive force

over a wide area, thus decreasing the force per unit area. In one respect the foam can be detrimental; at cuffs or other folds, the fabric portion is placed under tension, stretched, and made thinner, thereby decreasing its resistance to abrasion. Garment designers recognize this problem and take the proper precautions.

DELAMINATION —— Mention has already been made of poor bond strength resulting from excessive amounts of oils and finishes and from smooth fabric surfaces. On the other hand, a very strong bond may imply excessive heat during laminating and consequently very thin foam. In the case of adhesive lamination, a very strong bond may cause stiff fabric.

While it is not difficult usually to separate foam from fabric and to judge qualitatively whether or not the bond strength is commercially acceptable, we have developed a simple quantitative test, which has proved useful.

A strip one-inch wide and eight-inches long is cut from the laminate. About two inches are delaminated carefully and fabric and foam are clamped into the opposite jaws of a suitable tensile-testing device. Three tests are made on each sample and the average value obtained.

The lack of customer complaints has made it difficult to arrive at any definite minimum values of acceptability by the above delamination test, but it was found that about 500 grams is a value which is readily achieved in practice. This test is not only useful on new materials, but is also helpful for evaluating changes which may take place in washing or drycleaning, as shown in Table IX. Washing and drycleaning weaken the bond slightly, but except for one test, the bond was sufficiently strong to be acceptable, by our standards.

Sometimes the foam tears instead of pulling away from the fabric. This can be explained by the fact that a one-inch strip of foam has a strength of only 700 to 800 grams after laminating. The tearing of the foam is in itself useful information, for it suggests poor control during laminating.

ABSORPTION OF WATER—— Fear is sometimes expressed that the foam, being a sponge-like material, would become waterlogged in a heavy rain or that in laundering it would be very heavy and difficult to handle. Actually the foam is inherently water repellent and hydrophobic. The pores or capillaries are irregular in size, and the wicking is poor. The foam does not absorb water except with the aid of mechanical action. When treated for water repellency, the laminated fabrics make very acceptable raincoats, and even yachtsmen have found that trousers made from laminated cotton fabrics are superior to unlaminated materials. The trousers do not wet readily, and if they do get wet they are not as uncomfortable as unlaminated materials. Possibly this can be attributed to the extra thickness acting as a thermal barrier against evaporative cooling.

In order to obtain some quantitative data concerning the water absorption of laminated fabrics we performed a simple test in which the samples were vigorously shaken in distilled water for three minutes. The material was then placed between two blotters and passed through squeeze rollers. While this test was not severe enough to give thorough wetting of the samples, it did indicate the combined effect of rate of wetting, the amount of water held, and the amount that is readily removed by squeezing. Comparative results given in Table X show that the foam holds (after squeezing) less water than the textile materials. The wool samples were lower in absorption than one might expect because of the presence of spinning oils. Silicone treatment effectively decreased the water content.

TABLE IX
Force necessary to delaminate cotton bulky-knit half cardigan

		Force	
		Length (grams)	*Width (grams)*
	COTTON BULKY-KNIT HALF CARDIGAN		
1)	After lamination	560	500
2)	After washing once	653	613
3)	" " twice	466	533
4)	" " three times	490	520
5)	After drycleaning once	620	600
6)	" " twice	473	456
7)	" " three times	500	473
8)	After steam pressing	440	460
	COTTON KNIT HALF CARDIGAN		
1)	After lamination	486	495
2)	After washing once	490	406
3)	" " twice	463	370
4)	" " three times	483	426
5)	After drycleaning once	463	370
6)	" " twice	606	520
7)	" " three times	540	503
8)	After steam pressing	433	540

TABLE X
Water retained by foam and fabric

Samples	*Water content (%)*	
	Not laminated	*Laminated*
Foam only	31	—
Cotton bulky half cardigan	81	67
Cotton half cardigan	80	70
Wool bulky half cardigan	67	39
Orlon-wool jersey	113	65
Cotton sateen	60	46
Cotton bulky half cardigan, cotton treated with water repellent (heavy metal soap)	—	56
Cotton bulky half cardigan, cotton and foam treated with silicone	—	30

SUMMARY

A group of knitted and woven fabrics were "flame laminated" to polyester urethane foam and compared with conventional textile fabrics. The chemistry of foam has been discussed. The results can be briefly summarized as follows:

1) Bonding during flame lamination probably occurs by surface fibers of the fabric being embedded in the foam.

2) Foam stabilizes "stretchy" fabrics and the fabric compensates for the low tensile strength and poor abrasion resistance of the foam.

3) Foam does not shrink during laundering but the laminated material will shrink if the fabric is not dimensionally stable.

4) Laminated materials are stable to drycleaning.

5) Foam and textile materials of the same thickness are identical in thermal insulation characteristics. Since foam is generally thicker than most apparel fabrics, its contribution to insulation is greater than the fabric, even when measured in a compressed state.

6) Laminated wool or cotton fabrics are similar to wool blankets in density and compressional resiliency.

7) Foam is modified by flame lamination so that its flexibility and air permeability are increased. Laminated fabrics "breathe".

8) A quantitative test for measuring the bond strength between foam and fabric has been described. Washing and drycleaning slightly weaken the bond.

9) Water repellency and water absorption of laminated fabrics are comparable to those of conventional fabrics.

ACKNOWLEDGMENT

The authors thank the Messrs Feuerstein, principals of Malden Mills, for the opportunity to have made this study.

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(15) US Pat 2,957,793; J W Dickey assigned to Curtis Wright Corp, Oct 25, 1960.

Membership Applications

July 20-August 3, 1961

NEW ENGLAND REGION

Northern New England Section

Associate

William W Prichard—Asst dir of research, United Shoe Machinery Corp, Research Div, Beverly, Mass.

CENTRAL ATLANTIC REGION

Delaware Valley Section

Senior

William W Ranson—Dye div head, research & dev div, E I duPont de Nemours & Co, Inc, Organic Chem Dept, Wilmington, Del. Sponsors: P L Meunier, D R Baer.

Metropolitan Section

Senior

Jacob J Hauser—Plant engr, Tanatex Chem Corp, Kearny, NJ. Sponsors: S M Weinstein, A G Dabal.

Robert Feigin—Chemist, The Tanatex Chem Corp, Kearny, NJ. Sponsors: S M Weinstein, A Dabal.

Tom M Uhoda—Tech rep, Argus Chemical Corp, Brooklyn, NY. Sponsors: R G Perriello, D D Gagliardi.

SOUTHERN REGION

Northern Piedmont Section

Senior

David R Jackson—Sales dev & application, Nalco Chemical Co, Chicago, Ill. Sponsors: V C Smith, V B Holland.

Joseph A Parker Jr—Chemist, Collins & Aikman Corp, Ca-Vel, NC. Sponsors: J B Corinth, G A Heath.

Piedmont Section

Senior

Bobby L Crook—Tech sales engr, General Dyestuff Co, Charlotte, NC. Sponsors: W B Huntley, C A Bergman.

Rives R Jones—Sales engr, dyer, Allied Chem Corp, New York NY. Sponsors: E P Lavoie, E J Feeley II.

Junior

Frank J Venskunas Jr—Shift dyer, Morgan Laces Inc, Wilmington, NC. Sponsors: C A Gunther, M L Fillippeli Sr.

Southeastern Section

Senior

Ethel K Leonard—Asst chemist, Southern Regional Res Lab, USDA, New Orleans, La. Sponsors: L W Masseno Jr, R J Brysson.

Helen M Robinson — Chemist, Southern Regional Research Lab, USDA, New Orleans, La. Sponsors: W G Sloan, A S Cooper Jr.

Washington Section

Associate

Anna J Johnson—Textile tech, Harris Research Labs, Washington, DC.

AT LARGE

Senior

Stanley H Chambers—Gen supt, converting div, The Montreal Cottons Ltd, Valleyfield, Que, Canada. Sponsors: C R Teichgraber, F D Wallace.

Employment Register

This column is open for two insertions per year, per member, without charge. Blanks may be obtained from, and filed with, the secretary of the Association, Post Office Box 28, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the secretary.

61-17

Education: BS, textile chemistry, LTI.
Position desired: Textile chemistry.
Location: Massachusetts, Rhode Island or Eastern US.
Age: 24; single; references

8-21, 9-4

Elected to Membership

August 10, 1961

No designation after name indicates Senior
(A) indicates Associate
(J) indicates Junior
(S) indicates Student
* indicates transfer to another class of membership

NEW ENGLAND REGION

Northern New England Section

Stanley A Prokuski

Rhode Island Section

Hans W Albrecht
Marcel M Dursin Jr

CENTRAL ATLANTIC REGION

Hudson-Mohawk Section

Edward S Hobson

Metropolitan Section

William J Kiernan (A)
*John W Fawcett**

SOUTHERN REGION

Northern Piedmont Section

Donald G Brooks
W Raymond Hanks
J Robert Smith
James E Watson
Ross J Wood
*Johnny E Nettles**
Emerson M Yelton

Piedmont Section

John D Fisher

South Central Section

Fred R Prater Jr (J)

WESTERN REGION

Pacific Northwest Section

Richard J K Thomson
French E Smith

AT LARGE

Minoru Sekido
Paule Poirer (S)

"International Textile Technology—Key to Progress"

1961 NATIONAL CONVENTION

Niagara Frontier, Host Section • Statler Hilton Hotel, Buffalo, NY

September 27, 28 and 29, 1961

Exhibit Plans Nearly Complete

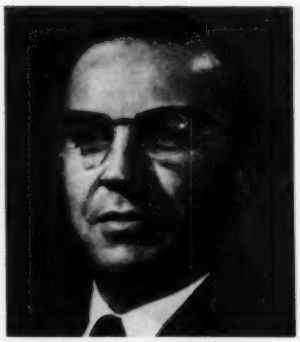
THE 1961 Convention exhibits program is nearly complete, according to Frederic Sievenpiper, National Aniline Div, exhibits chairman. It will feature displays by nonprofit research organizations and technical schools as well as dyestuff and chemical suppliers, equipment manufacturers, and instrument designers.

A major part of the exhibit space was committed by early July. The exhibit room facilities, however, are very flexible and will accommodate all latecomers. Suppliers serving the textile industry will benefit themselves and the Association by participation in the exhibits program.

The exhibitors list to date includes the following:

Howes Publishing Co, Inc

Antara Chemicals, a Division of General Aniline & Film Corp



Frederic Sievenpiper

General Dyestuff Co, a Division of General Aniline & Film Corp

Quartermaster Research & Engineering Command, U S Army

American Society for Testing Materials

Arthur H Thomas Co

American Association of Textile Chemists and Colorists

Wallerstein Co

Fisher Scientific Co

Atlas Electric Devices Co

Custom Scientific Instruments, Inc

Rohm & Haas Co

Birch Brothers, Inc

Daily News Record

Becco Chemical Div, FMC Corp

The Chemstrand Corp

Diamond Crystal Salt Co

Morton Salt Co

Hunter Associates Laboratory, Inc

Union Carbide Chemicals Co, Div of Union Carbide Corp

Gaston County Dyeing Machine Co

Davidson & Hemmendinger

Ladies' Committee Planning Interesting Program

THE Ladies' Program Committee, under the chairmanship of Margaret R Hallinan, National Aniline Div, is planning an interesting time for the ladies who plan to attend the 1961 AATCC Convention at Buffalo, NY, Sept 27-29.

A special exhibit of modern fabrics designed to captivate the ladies has been made possible through the cooperation and generosity of several textile manufacturers and dyers.

A limited number of tickets will be available for the television program "Yankee Doodle Time", and the radio broadcast of "Top of the Town". Both are audience participation programs.

A conducted tour to Niagara Falls, with stops to view the Canadian Falls, American Falls, Rapids, Niagara Gorge and the new Niagara Power Project, will be followed by a luncheon in Canada.

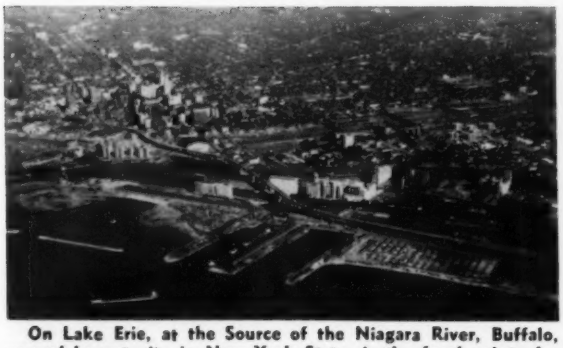
Margaret R Hallinan

Hostesses will be present in the Hospitality Room on Wednesday, Thursday and Friday to assist the ladies in getting acquainted and arranging activities of special interest.

All functions of the Ladies' Program will be included in the $10.00 registration fee.

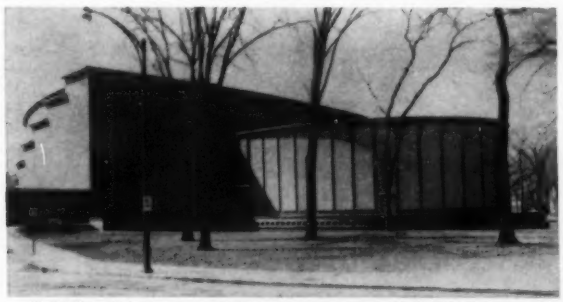
Assisting Miss Hallinan on the Ladies Committee will be the following: Mrs James Best, Mrs William Leyking, Mrs James Loughlin, Mrs Carl Ludders, Mrs Zane Messinger, and Mrs Anton Viditz-Ward, Niagara Frontier Section; Mrs John Wallace, Mrs K Lister, Mrs J Wolfe, Mrs E P Carney, Mrs N Mohoruk, and Mrs J C Mansfield, Ontario Section, CATCC; Mrs F J Szurek, Hudson-Mohawk Section; Mrs Matthew Babey, Metropolitan Section; Mrs Timothy J Horan, Western New England Section; Mrs William B Amos, Southeastern Section; Mrs Richard R Rettew, Palmetto Section; Mrs Clarence A Seibert, Delaware Valley Section; and Mrs George P Paine, national headquarters.

Buffalo, NY—The 1961 Convention City



On Lake Erie, at the Source of the Niagara River, Buffalo, second largest city in New York State, is the focal point of a great historical and scenic area known as the Niagara Frontier. The threshold of Niagara Falls and the gateway to Canada, Buffalo is the natural headquarters for visitors to the area. Being the 14th largest city in the United States, its metropolitan facilities offer home comfort convenience and easy access to every interesting point throughout the Niagara Frontier area.

One of the wonders of the world is the awe-inspiring natural spectacle of Niagara Falls, which is 20 minutes from downtown Buffalo via the New York State Thruway.



Buffalo claims one of the finest music halls in the world, Kleinhans Music Hall. Acoustical and lighting research which preceded its design make it ideal for the musician, actor and the pleasure of the audience. It is the home of the Buffalo Philharmonic Orchestra and the scene of operas, lectures, and scores of cultural events. Main auditorium capacity is 3,600.

The classic Albright Art Gallery boasts a constantly changing collection of art in addition to its permanent collection of paintings and pieces of sculpture. It is situated in a picturesque setting near Delaware Park Lake. A recently proposed $1,000,000 addition will contain a sculpture court, classrooms, and a theatre.

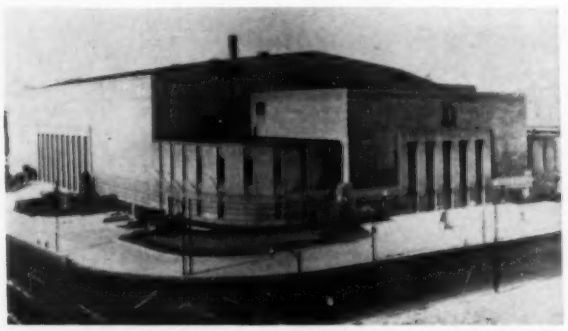
Visitors are welcomed on the 164-acre campus of the University of Buffalo. An urban university founded in 1864 with Millard Fillmore as its chancellor, it now has an enrollment of approximately 20,000 in its schools of dentistry, engineering, pharmacy, medicine, law, arts and sciences. Picture at left shows Administration Building. General view of campus is at right.

Buffalo, NY—The 1961 Convention City———

Buffalo City Hall

A symbol of international friendship over the swift Niagara River, the Peace Bridge to Canada . . . ten minutes from downtown Buffalo to visit another nation, without a passport.

Buffalo World Port . . . Through the new St Lawrence Seaway travel the ships of all nations to Buffalo.



Sporting events, shows and conventions are presented under the pillarless roof of Buffalo's Memorial Auditorium. The main auditorium, which seats 15,000, is cooled to ideal comfort in summer with filtered air.

COUNCIL; NATIONAL COMMITTEES

Sept 26 (Statler Hotel, Buffalo, NY); Council (8 PM)

Oct 26-27 (Sheraton Hotel, Philadelphia, Pa); TCR, research and administrative committees

Nov 17 (Hotel Sherman, Chicago, Ill); Council and Annual Meeting (2 PM)

Jan 26 (Hotel Commodore, New York, NY); Council (10 AM)

Apr 12-13 (Francis Marion Hotel, Charleston, SC); Council, administrative and research committees

NATIONAL CONVENTIONS

Sept 27-29, 1961 (Hotel Statler, Buffalo NY); Nov 14-17, 1962 (Atlanta Biltmore Hotel, Atlanta, Ga); Oct 30-Nov 2, 1963 (Boston, Mass); Oct 1-3, 1964 (Hotel Statler, New York, NY); Oct 14-16, 1965 (Conrad Hilton Hotel, Chicago, Ill); 1966 (Philadelphia, Pa)

DELAWARE VALLEY SECTION

Sept 15 (Wilmington, Del); Oct 27, Dec 1 (Beck's Restaurant, Philadelphia, Pa)

MID-WEST SECTION

Nov 18 (Chicago, Ill)

AATCC Calendar

NORTHERN NEW ENGLAND SECTION

Sept 8 (Annual Outing, Wachusett Country Club, West Boylston, Mass); Oct 20 (Quartermaster R & E Command, Natick, Mass); Dec 18 (Motel 128, Dedham, Mass); Jan 19 (Woodlawn Country Club, Newton, Mass)

NORTHERN PIEDMONT SECTION

Oct 7 (Hotel Roanoke, Roanoke, Va)

PACIFIC NORTHWEST SECTION

Nov 10 (business meeting)

PACIFIC SOUTHWEST SECTION

Oct 7-8 (Annual Outing, Rancho Santa Fe, Calif;) Nov 17

PALMETTO SECTION

Sept 15-16 (Clemson House, Clemson, SC); Jan 20-21 (Poinsett Hotel, Greenville, SC); April 14-15, 1962 (Francis Marion Hotel, Charleston, SC)

PIEDMONT SECTION

Sept 23 (Hotel Barringer, Charlotte, NC); Jan 27 (Hotel Charlotte, Charlotte, NC); Apr 7 (Hotel Barringer, Charlotte, NC); June 8-9 (1962 Outing—Mayview Manor, Blowing Rock, NC); Sept 29, 1962 (Hotel Barringer, Charlotte, NC)

RHODE ISLAND SECTION

Sept 15 (Management Meeting); Oct 17 (Dinner Meeting); Dec 1 (Annual Business Meeting)

SOUTH CENTRAL SECTION

Sept (Hotel Patten—tentative)

SOUTHEASTERN SECTION

Sept 9 (Ida Cason Gardens, Pine Mountain, Ga); Nov 25 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION

Sept 15 (Plant visitation); Oct 27 (Annual Meeting) Dec 1 (Shelton, Conn)

COUNCIL HIGHLIGHTS

(Adopted from official minutes of the 223rd Council Meeting)

COUNCIL held its 223rd meeting Friday evening, April 21, 1961 at the Jack Tar Hotel, Durham, NC at the invitation of the Piedmont Section.

Following the approval of the minutes of the 222nd meeting by the Council, Nelson F Getchell, chairman of the nominating Committee, reported that nominations for 1962 were as follows: *For president*—E Morrill; *For vice presidents*—J Edward Lynn (New England Region), W S Sollenberger (Central Atlantic Region), J D Mosheim and L Smith (Southern Region), and J H Jones (Western Region).

* * *

An invitation to AATCC to exhibit at the National Chemical Exposition which is being sponsored by the Chicago Section of the American Chemical Society September 5-8 was accepted. An exhibit is to be prepared for display at the Exposition and also at the Buffalo Convention, the cost not to exceed $1,000.

* * *

The resignation of Arthur R Thompson as treasurer of AATCC was accepted as of December 31, 1961.

* * *

A motion to send George J Mandikos, AATCC's technical secretary, to England for the ISO meetings held in May was unanimously approved by Council. E R Kaswell headed the American delegation, which also included W Klaas.

* * *

Council was advised by C A Sylvester, chairman of the Executive Committee on Research, that he would introduce a written report on behalf of ECR and the Technical Committee on Research to be included in the minutes. The text of the report follows:

"The Technical Committee on Research had held a very interesting and well-attended meeting. Five committees held meetings in Durham today and reported in a panel-discussion type meeting. The subjects covered included Water Absorbency, Colorfastness of Washing, Damage Caused by Retained Chlorine, Colorfastness to Textiles to atmospheric contaminants and Bleaching.

"V D Lyon reported for the Washfastness Committee, outlining the Committee's program to determine if the Accelerated Wash Tests IIA and IIIA adequately cover the intermediate levels of washfast garments. A comprehensive interlaboratory program is scheduled in which cotton and rayon and fabric blends colored with different classes of dyes will be subjected to repeated washings at 100°, 120° and 140°F, using the different types of home automatic washing machines available today. These results will be correlated with our test methods.

"A C Nuessle gave a very interesting report on the progress the Committee on Chlorine Retention has made toward reproducible results with the test method.

"Dr V S Salvin reported that the Committee on Colorfastness to Atmospheric Contaminants has outlined a program to determine whether color fading takes place for reasons other than chemical action of light. A comprehensive program has been formulated which includes exposure of different-type fibers colored with different classes of dyes to atmosphere but not to sunlight in Florida, Arizona, California and possibly in an industrial area, such as New Jersey.

"B K Easton, chairman of the Bleaching Committee, reported the following recommendations of the Committee:

1) That the test method for determining hydrogen peroxide in bleach baths be published in the *Technical Manual.*
2) That a new proposed test method for colorfastness to peroxide bleaching be circulated to TCR for approval by letter ballot.
3) That the test method for determining the pH of water extracted from bleached woven cotton cloth be raised from tentative to standard.

A E Johnson proposed that AATCC consider the development of a test method for determining fiber degradation resulting from sunlight exposure.

"Sixteen new appointments were made to existing Research Committees.

"The Executive Committee on Research is very actively studying research objectives of AATCC. A special meeting was held in March and another is scheduled for June."

* * *

T R Smith, chairman of the Appropriations Committee, called attention to a financial statement presented by the treasurer's office, stating that as of March 15, 1961, the market value of securities held by AATCC was $529,716.

* * *

Council approved a budget for the fiscal year beginning August 1, which provided for a net operating income of some $25,000. Estimated costs and expenses are $52,094 for research, $71,338 for general administrative, $34,000 for ADR's and Technical Manuals supplied to members, and $6,200 for section membership allowances. Estimated income is as follows: $130,700 from membership dues, $36,000 from publishing rights, $12,000 from investment income, $6,000 from royalties, and $2,000 from sales of technical supplies. The budget also provides for total capital expenditures of $1,000.

In conjunction with the operating budget of $163,632 there were three additional items for which approval was requested. The first was an allocation of a budget of $2,500 to the Publications Committee for promotional activity concerning the sale of the *Colour Index,* such sales programs to be approved by the Publications Committee. The second item was for authority to carry forward the balance of an amount already appropriated for manuscript work on a revised edition of "Analytical Methods for a Textile Laboratory", namely $300. The third item was a budget of $7,500 for the purchase of technical supplies to replenish inventory. These items were recoverable through income derived from distribution and sale.

Not included in the budget figures was an item of $2,500 requested by the Committee on Weathering for the production of yellow methacrylate plates for use in calibrating accelerated carbon-arc machines. These funds would be contributed to the National Bureau of Standards. They would make the plates and offer them for sale. The matter had been investigated by the Committee through F Rizzo, who regarded it as the most practical, effective and feasible method of making the plates available through a responsible agency.

Other research activities contemplated under the research budget are as follows:

RA33-Colorfastness of Textiles to Atmospheric Contaminants: To correlate fading of dyes by factors other than light, in atmospheric exposure with performance. This is a carry-over of project approved in last fiscal year for which funds allocated have not as yet been touched. $600

RA35-Damage Caused by Retained Chlorine: Additional test fabrics and/or test materials to be used in projects on improving the precision of the test method and attempting to correlate with end use. $200

RA50-Colorfastness to Light: Continuation of program set up for previous fiscal year. The program includes:
1) Analyzing the use of Langley units for measuring light exposures. 2) Interlaboratory studies involving comparison of the laboratory light test vs actual natural light exposure. 3) Exposure tests pertinent to developing an accelerated test for evaluating colorfastness to weathering. $2000

RA52-Colorfastness to Perspiration: To conduct human body tests in attempt to correlate test method with end use. $3000

RA56-Evaluation of Finishes for Resistance to Staining and Soiling: Purchase of approximately 200 yards of fabric to be used in conjunction with two major projects being studied by Committee RA56. The wet soiling task group requires fabric for soil redeposition studies and the group investigating resistance to oil-type stains requires oil-repellent-treated fabrics for their work. $200

RA58-Stream Sanitation: Cooperative work with the National Technical Task Committee on Industrial Waste Guides. $500

RA60-Colorfastness to Washing: Purchase of special fabrics to be used in inter-laboratory correlation of five washings in home laundry equipment versus IIA and IIIA Tests (AATCC 61-1961T). $200

RA61-Wash and Wear: Preparation and mailing of samples. From time to time it is necessary to cut, prepare and send samples to members for testing. The above funds are needed to effectively carry out this portion of the committee's program. $1000

RA64-Weathering of Textiles: To aid in developing a tentative AATCC test method for the accelerated weathering of textiles. Natural weathering exposures on a series of fabrics assembled by Mr Rizzo will be made at various locations. Some of these exposures will be made at no cost to AATCC. Others will be made at testing locations of private firms, principally in Arizona. $2000

Contributions to National Bureau of Standards in support of project on methacrylate plates for use in calibrating accelerated carbon-arc machines. $2500

1960 Convention Exhibits. $1000

Contingency. $1000

Special projects including Visual Aids Facilities for Research Committees. $5000

TOTAL $19,200

* * *

Council was advised that the 1960 Convention in Philadelphia had resulted in a surplus, and that $6,540.86 would be transferred to the Convention Reserve.

Council acted to accept the invitation of the Delaware Valley Section to be host to AATCC for its 1966 Convention.

* * *

In other business, Council

1) Approved the appointment of A H Rant as a member of the Annual Intersectional Technical Paper Competition Committee,

2) Discharged with thanks the Study Committee on Location of National Headquarters,

3) Accepted an invitation by the Palmetto Section to meet in Charleston, SC, on April 13 and

4) Approved the executive secretary's financial report.

Council also heard reports from W A Holst, chairman of the Committee on Constitution and Bylaws; W G Parks, chairman, Committee on Membership and Local Sections; P J Luck, chairman, Publications Committee; H A Stauderman, chairman, Individual Membership Committee; W S Sollenberger, chairman, Corporate Membership Committee; and E I Stearns, chairman, Committee on Conventions.

* * *

Following a brief recess at 9:33 pm the president called the Council into executive session, at which time all but Councilors or their accredited representatives were excused. The meeting was adjourned at 12:25 am.

AATCC TO EXHIBIT AT NATIONAL CHEMICAL EXPOSITION IN CHICAGO

MEMBERS of AATCC are invited to visit the Association's display at the National Chemical Exposition, sponsored by the Chicago Section of the American Chemical Society, at the International Amphitheatre, September 5-8. The AATCC booth will be located in the Special Exhibits Section and will provide a meeting place for friends and visitors passing through the International Amphitheatre. The exhibit will be open from 11 AM to 10 PM, Tuesday, Wednesday, and Thursday, September 5-7 and from 11 AM to 6 PM on Friday, September 8.

The National Chemical Exposition is being held in conjunction with the Annual Meeting of the American Chemical Society. Over 1500 technical papers will be presented at this meeting in some 22 divisions of the Society.

The Special Exhibits Section will feature a prefabricated house for general living, dehydrated and irradiated foods, transportation, energy, textiles and displays on other subjects relating to the general theme of the exposition: "Your Life in the Future—Through Science."

Admission tickets will be circulated in advance to the members of AATCC's Mid-West Section. Other members wishing to attend the National Chemical Exposition may obtain tickets by writing to AATCC National Headquarters, PO Box 28, Lowell, Mass.

SOUTHERN TEXTILE RESEARCH CONFERENCE

THE first Southern Textile Research Conference will be held at the William Hilton Inn, Hilton Head Island, SC, on Thursday and Friday, October 19 and 20, 1961, according to an announcement by Vernon C Smith, chairman of the Sectional Research Committee, Piedmont Section, sponsors of the Conference.

The program will consist of talks on "The Wet Processing of Textiles" by leading authorities followed by a group discussion. The theme of the conference will be " The Solution of Practical Problems Through the Use of Fundamentals."

Luther B Arnold Jr, chairman of the Steering Committee for the conference, has announced the following speakers and their topics: Emery Valko, Lowell Technological Institute, "The Fundamentals of Dyeing Phenomena"; Henry E Millson, American Cyanamid Co, "Movies of Dyeing Phenomena with the Microdyeoscope"; and E M Hicks Jr and Burt A Faris, E I duPont de Nemours & Co, Inc, "Relation of the Properties of Synthetic Fibers to Wet Processing and End Use." Friday evening will be devoted to a panel discussion on "Problem Solving Through the Application of Fundamentals."

Applications for attendance at the Southern Textile Research Conference may be obtained from Luther B Arnold Jr, Vikon Chemical Co, Box 277, Elon College, NC. The conference will be limited to 50 conferees, selected from the applicants to obtain as wide industry representation as possible.

Activities of the Local Sections

Hudson-Mohawk*

HUDSON-MOHAWK Section held its 13th annual outing and golf tournament at Antlers Country Club, Tribes Hill, NY, on June 23, 1961. One hundred and thirty-one members and guests attended dinner, with a short business meeting following.

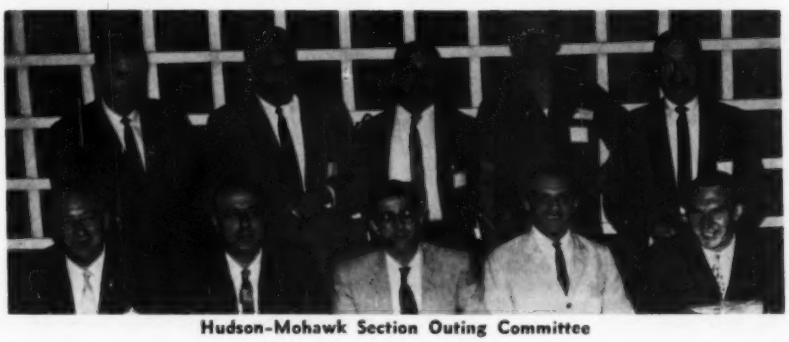
Through the entire day tournaments were held in the following sports: golf, putting, horseshoe pitching, croquet and badminton. Robert Quiri, Ritter Chemical Co, won the Ciba golf trophy with his low gross score, and prizes were awarded to the winners of the other tournaments. The winner-take-all pot was won by John Merrill of Cluett-Peabody.

Each individual in attendance was the recipient of a door prize made available through gifts and monetary donations to the Section.

L Donald LaTorre served as chairman of the outing and members of the section assisted with registration and the sports tournaments.

*Editor's note: We regret that space limitations prevent the presentation of two pages of photos of the Hudson-Mohawk Section outing in this issue. They will appear Sept 4.

HUDSON-MOHAWK SECTION'S INCOMING OFFICERS FOR 1961-1963. L to r: Anthony Cassetta, Mohasco Industries Inc, secretary; Achilles Mafilios, Ritter Chemical Co, chairman; Armand Di Meo, Rebel Dyeing Corp, vice chairman; Walter Drautz, General Aniline & Film Corp, treasurer. Photo was taken at the Section's annual outing held at Tribes Hill, NY, June 23.



Hudson-Mohawk Section Outing Committee

South Central

SOUTH CENTRAL SECTION held its 1961 annual outing June 16-17 at the Riverside Hotel, Gatlinburg, Tenn, with approximately 145 persons attending.

General chairman was R H Krauss, Solvay Process Div, Allied Chemical Corp. He was assisted by Bill Quigg, R J Quigg Chemical Co, and the following committeemen: Ronald J Fryer, Sandoz, Inc, *golf;* Charles Braswell, Seydel-Woolley & Co, *horseshoe pitching;* Jack Martin, Geigy Dyestuffs, Mr Quigg and Norman Birchler, Morton Salt Co, *casting;* Mrs W D Blackman Jr, *ladies activities.*

Winners in the golf tournament held at the Gatlinburg Country Club were as follows:

Low gross, millmen—William Hart, Princeton Hosiery Mills, 94; Herbert Scott, Princeton Hosiery Mills, 102; Bill Hurley, Kingsboro Silk Mills, 102.

Low net, millmen—Ed Eismann, Franklin Process Co, 114-44-70; Harvey Delay, Standard Coosa Thatcher, 106-31-75.

Low gross, suppliers—Tom Hawkins, Diamond Alkali Co, 83; L C Harmon, Rohm & Haas Co, 85; Norman Price, Althouse Chemical Co, 85.

Low net, suppliers—William Elmer, Shell Chemical Co, 138-71-67; Gene Cote, Interchemical Corp, 122-48-74.

High net, suppliers—Charles Braswell, 110-30-80.

High net, millmen—Newman Horner, Cobble-Muse Hosiery Mills.

"Hole-in-one" — Norman Price, Althouse Chemical Co.

In fly casting, Gene Cote took first-place honors with 16 points, and Herbert Scott was second with 15.

In horseshoe pitching, Charles Braswell won the singles event, with Norman Price the runnerup. The team of T D Owens, Franklin Process Co, and Bill Hart won the doubles championship; Fred Broadhurst, W F Fancourt Co, and Tom Howard, Roane Hosiery Mill, were runnersup.

Winners in men's bridge were William B Elmer, who had the highest score, and Kenneth Miller, Augusta Chemical Co, second high score Jack McNab, Mac Chemical Co was awarded a prize for low score.

Mrs L C Harmon was first in the

Golf winners. L to r: Buddy Harmon, Rohm & Haas, second low gross, suppliers; Bill Hurley, Kingsboro Mills, second low gross, millmen; Tom Hawkins, Diamond Alkali Co, low gross, suppliers; Norman Price, Althouse Chemical Co, second low gross, suppliers; Herb Scott, Princeton Hosiery Mills, second low gross, millmen; Bill Hart, Princeton Hosiery Mills, low gross, millmen.

Golf Winners. L to r: Norman Price, Althouse Chemical Co, "hole in one"; Gene Cote, Interchemical Corp, second low net, suppliers; Ed Eisman, Franklin Process Co, low net, millmen; Bill Elmer, Shell Chemical Co, low net, suppliers; Charles Braswell, Seydel-Woolley & Co, high net, suppliers; Harvey Delay, Standard Coosa Thatcher, second low net, millmen; Newman Horner, Cobble-Muse Hosiery Mills, high net, millmen.

Horseshoe-pitching Winners. L to r: Norman Price, Althouse Chemical Co, second, singles; Tom Howard, Roane Hosiery Mill, second, doubles; Fred Broadhurst, W F Fancourt, second, doubles; Charles Braswell, Seydel-Woolley & Co, first, singles; Bill Hart, Princeton Hosiery Mills, first, doubles; Drayton Owens, Franklin Process Co, first, doubles.

Men's Bridge Winners. L to r: Jack McNab, Mac Chemical Co, third prize; Kenneth Miller, Augusta Chemical Co, second prize; Bill Elmer, Shell Chemical Co, first prize

Jack Anderson, (left), Peerless Woolen Co, is presented Special Service Award by Dick Tyrrell, Peerless Textiles, chairman of the Section. Seated is Mrs Anderson.

Fly-casting Winners: Gene Cote (left), Interchemical Corp, first prize; Herb Scott, Princeton Hosiery Mills, second prize

L to r: Mrs R J Tyrrell; Mrs Z S Cowan Jr; Mrs Art Watson; Mrs Edward S Johnson

L to r: Mrs Charles Braswell; Mrs Fred Broadhurst; Mrs William Cheek; Mrs Jack Rose

Winners of the Barbership Quartet Contest held on Friday night. L to r: H A Desmarais; Joe Gaffney, Blackman-Uhler; Gene Cote, Interchemical Corp; Dick Tyrrell, Peerless Textiles, chairman of the South Central Section. Bill Quigg is in background.

L to r: Mrs Bill Quigg; R H Krauss, Solvay Process Div, outing chairman; Mrs Charles Nixon; Charles Nixon, Chapman Chemical Co; Bill Quigg, R J Quigg Chemical Co

ladies bridge competition, with Mrs Fred Macnamara second. Mrs Jack Rose won the ladies canasta tournament, with Mrs Fred Broadhurst second.

R J Tyrrell, Peerless Textiles, chairman of the South Central Section, presided at the banquet Saturday evening, at which time a special service award plaque was presented to Jack Anderson, Peerless Woolen Mills, for his past services to the Section. Mr Anderson has served several times as chairman and councilor.

METROPOLITAN SECTION OUTING

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JUNE 9, 1961

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NORTH JERSEY COUNTRY CLUB
WAYNE TOWNSHIP, NJ

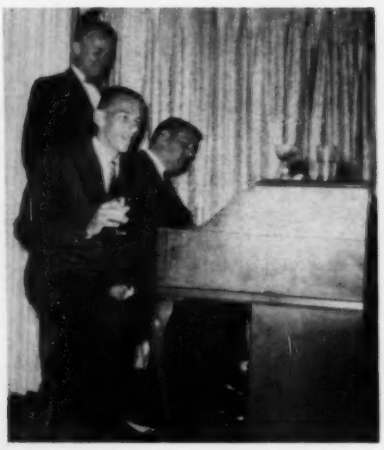
(See report on page 61 of July 24 issue)

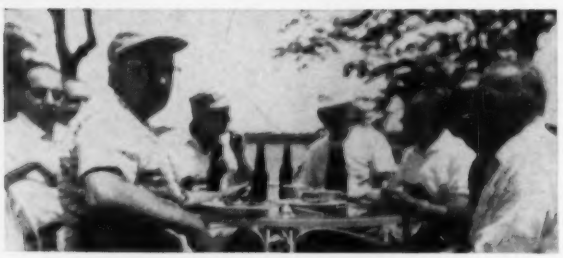
METROPOLITAN SECTION OUTING COMMITTEE—Standing, l to r: E J Grady, Jacques Wolf & Co; G Heine, Koppers, Inc; W F Ferrazano, National Aniline Div. Seated, l to r: P J Fynn, J C Penney Co, Inc; C Germanetti, Vivitone, Inc; E Bobilin, Sandoz, Inc; R E Miller, Eastman Chemical Products, Inc

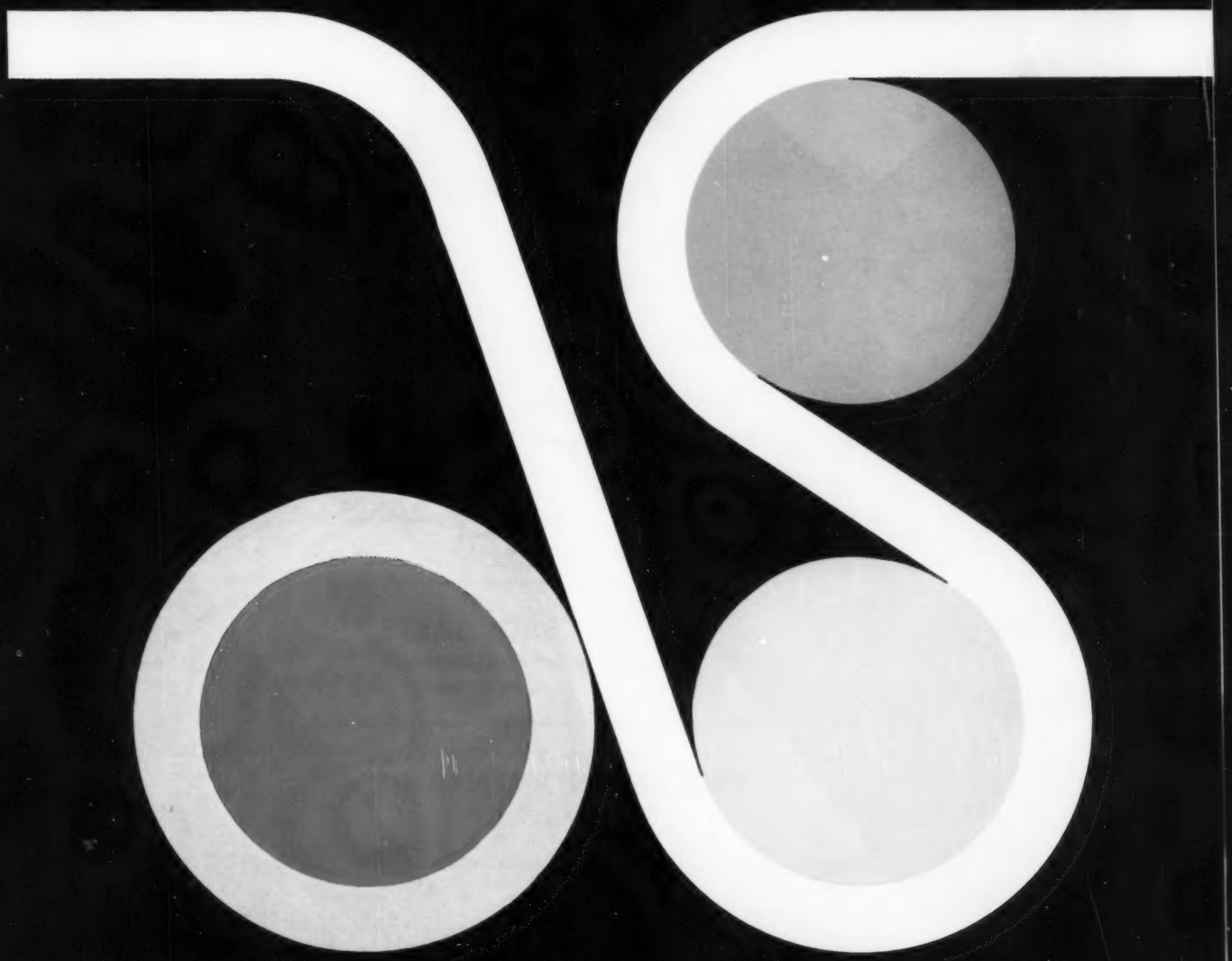
Winners of the various golfing events receive congratulations of Outing Chairman Edward Bobilin (third from left in photo at left) and Golf Chairman Charles Germanetti (second from right in photo at right)

MID-WEST SECTION OUTING

JUNE 24, 1961 • BROWN'S LAKE, WIS







SUNTONE® *textile pigment printing colors*

TEXTILE COLOR DEPARTMENT

ANSBACHER-SIEGLE CORPORATION

DIVISION

Sun Chemical Corporation

WOOD RIVER JUNCTION, R. I. · STATEN ISLAND 5, NEW YORK · ROCK HILL, S. C.

E.J.FEELEY COMPANY

E. J. Feeley Co.

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Direct Selling Agents in the South of

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(STORED IN TEMPERATURE CONTROLLED VAULTS TO INSURE FRESHNESS)

PHARMANTHRENES
(VAT DYES)

PYRAZOLINES
(FAST DIRECT DYES)

DIPYRAZOS
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COLORS FOR WOOL

PHARMA

Manufactured by

PHARMA CHEMICAL CORPORATION

Plants:
BAYONNE • NEW JERSEY

SOFTENER RC

PENETRATING SOFTENER FOR

PACKAGE BEAM YARN THREAD

EXCELLENT LUBRICITY
in cutting · knitting · sewing

NO SHADE CHANGE
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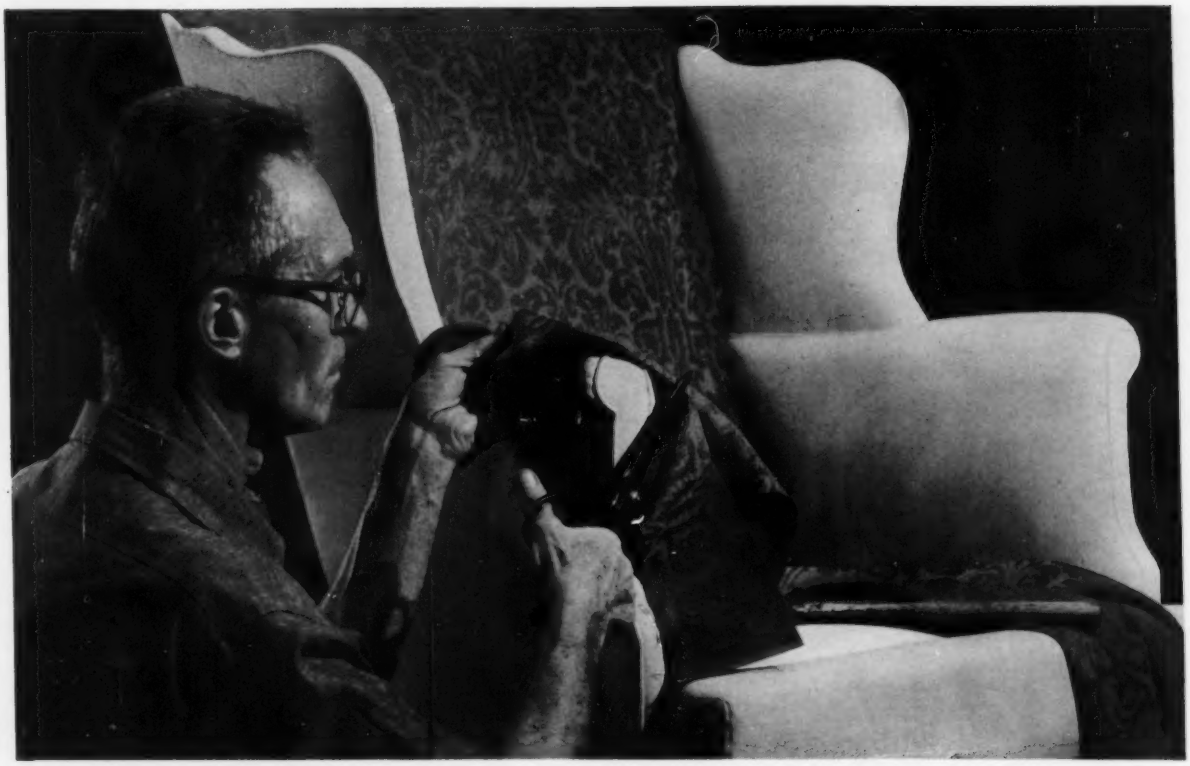
- cotton
- nylon
- orlon
- acetate
- rayon

CHEMICAL PRODUCTS CORPORATION

Manufacturing Chemists

WEST PATERSON • NEW JERSEY · OFFICES AND WAREHOUSES · **CHARLOTTE • NORTH CAROLINA**



New Rhoplex® acrylic resins for non-stiffening, non-yellowing backing for furniture upholstery

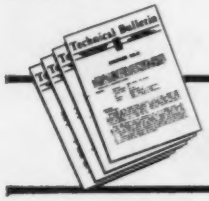
Extremely durable backings and binders for fabrics and carpeting—plus other advantages possible only with acrylic materials—are produced by two new self-crosslinking RHOPLEX acrylic resins that cure to tough, resistant polymers under catalysis and heat. The usual vulcanizing agents, plasticizers, and anti-hardening agents are not needed with RHOPLEX HA-8 and RHOPLEX HA-12.

RHOPLEX HA-8 is a highly durable acrylic polymer which produces finishes that withstand dyeing, washing, and drycleaning. It may be used alone, or in combination with fillers, thickeners, or other RHOPLEX resins.

RHOPLEX HA-12 is similar to RHOPLEX HA-8, but produces firmer finishes with improved tensile strength, and may be used with RHOPLEX HA-8 to obtain intermediate effects.

Both products are effective binders for non-woven fabrics, adhere well to synthetic fibers, are ideal for backcoating automotive and furniture upholsteries, and are good pigment binders. They resist discoloration and stiffening with age. They do not discolor fibers since the cured polymer is water-clear.

Other RHOPLEX binding and backing materials, such as RHOPLEX HA-4 and RHOPLEX B-15 may be used to modify RHOPLEX HA-8 and RHOPLEX HA-12.



Write Dept. T-1 for technical bulletins summarizing properties and uses of Rohm & Haas RHOPLEX acrylic materials for fabric finishes, backcoatings, and binders.

ROHM & HAAS

PHILADELPHIA 5, PA.

RHOPLEX HA-8 HA-12

ADR News Report:

General News of the Industry
Personalities in the News
New Products, Developments, Processes

NSCC to Build Monomer Plant

National Starch and Chemical Corporation has announced plans to build a $4,000,000 vinyl acetate monomer plant. Donald D Pascal, president, stated that the annual capacity of the new chemical plant will be 45,000,000 lbs.

One of two sites currently under study in Texas will be selected for the location of the plant. Construction is scheduled to commence late this year, and the new facility is expected to be in operation during the fall of 1962.

National Starch and Chemical, a producer of polyvinyl acetate polymers and copolymers, began research on these products in 1942. The company built its first polymer plant in 1946 at Plainfield, NJ. A second plant was built at Meredosia, Ill, in 1954, and as the result of several expansions capacity has now been quadrupled.

Mr Pascal stated that National is currently producing 36 different polymers and copolymers of vinyl acetate. It is reported that a substantial portion of the Company's $2.5 million research and technical development budget is devoted to this effort.

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Onyx Creates New Division

Onyx Chemical Corp, Jersey City, NJ, will have a new division to be known as the Finishes & Coatings Division. It was announced this month by F O Robitschek, president, that the new division will commence operations immediately. The Finishes & Coatings Division will be managed by Philip E MacLean.

Mr MacLean has been with Onyx since 1947 as salesman, New England district manager and most recently, sales manager. As manager of the Finishes & Coatings Division, Mr MacLean will be responsible for the promotion and sale of Onyx products to the textile, paper, leather and plastics industries; as well as related fields where surface coatings are applied.

R L Wakeman, corporate technical director, has wide experience in textiles and paper and is an authority on polymer chemistry.

Sidney Cohen will serve as head of textile research and development. He has some 17 years experience in research for textile, leather, and paper finishes and coatings.

Morton Schlesinger will serve as director of technical services. Mr Schlesinger recently returned to Onyx after a seven-month leave of absence as a technical expert for the U S Government overseas.

John Vellenkamp has rejoined Onyx as plant manager.

Onyx recently announced the return of George R Purdy to cover the metropolitan area of New York, New Jersey, and eastern Pennsylvania as technical sales representative.

This move reportedly gives Onyx sales coverage in every major industrial area throughout the country.

•

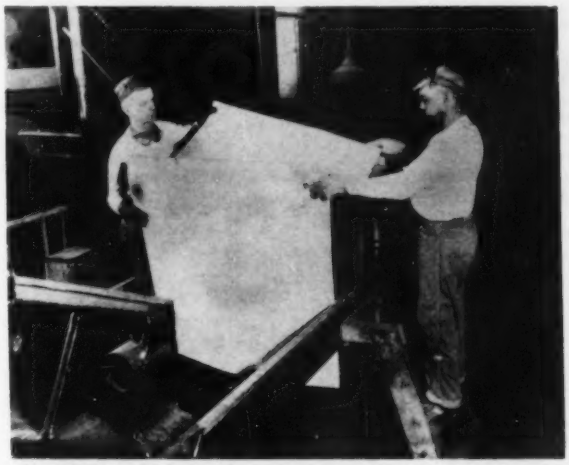
Dynel Felt Combines Efficiency with Long Life in Chemical Filtration Process

High efficiencies in the filtration phase of pigment and dyestuff production resulting from the use of Windsor felt filters of Dynel modacrylic fiber have been reported by American Cyanamid Company.

The four features of Windsor felt that have led to its being selected in 1959 for use in Cyanamid's Dye Manufacturing Department are said to be imperviousness to acids, ability to isolate fine particles without plugging or clogging, long life expectancy and proficiency as a gasketing substance.

In the two years the filters have been in service, Cyanamid reportedly has found them to be "completely satisfactory" in most applications. The original set, installed in 1959 and used continuously since then, is said to be in excellent condition with a life expectancy stretching indefinitely into the future.

The high-density nonwoven filtering fabric is produced from Union Carbide Corp's Dynel modacrylic fiber by American Felt Co, Glenville, Conn. It is employed by Cyanamid in a battery of horizonal plate-and-frame presses to extract pigments, vat dyes and dye intermediates from slurries in which the liquid is usually a 15 to 20 percent solution of sulfuric acid.



DYESTUFF FILTRATION in this typical plate-and-frame press at American Cyanamid Company's Bound Brook, NJ, plant depends for efficiency on Windsor felt filter material furnished by the American Felt Co, Glenville, Conn, and made of Dynel fiber. Here a blanket of the filter material is being draped over one of the battery of plates in the press.

Cyanamid's largest presses are said to have capacities (inside clear lengths) of about 10 feet each. In such a press, 56-inch plates and frames made from heavy lumber are alternated and stacked on edge. A length of the Windsor filter felt of Dynel is draped over each plate like a blanket over a clothesline, completely covering both faces. Over this goes a top cloth of synthetic woven fabric.

When the plates, frames and filters are all in place, they are forced tightly together between a movable and a fixed plate under 1,200 pounds pressure imparted by a hydraulic ram. In the process, the borders of the filter fabric are compressed between the plates and the frames, forming gaskets that make the whole multi-layer "sandwich" liquid-tight.

Then a batch of acid slurry is pumped into the press through a coupling in the fixed plate. As the slurry passes through the filters, they isolate the solids, which are collected in the open centers of the frames. During this process, internal pressure sometimes builds up to as high as 50 pounds per square inch. The "gasket" borders of the felt reportedly take this pressure with no signs of leakage.

After each batch has been filtered, the press is opened, the solids are removed from the frames and the top cloths are scraped clean. As many as four batches can be handled each 24-hour day by each press in service, it is claimed. The only maintenance required other than the scraping of the top cloths is an occasional sluicing with water.

•

Tickets for 1st International Dyestuffs, Finishes and Auxiliaries Exhibition Available

Admission is free to the First International Dyestuffs, Finishes and Auxiliaries Exhibition to be held Sept 12-15 in the Exhibition Hall, Harrogate, Yorkshire, England. Tickets may be obtained by writing to Clarke & Rhodes Ltd, 274-8 The Corn Exchange, Manchester 4, England.

Visitors to the Exhibition will be able to see the latest developments in raw materials, processes and some equipment calculated to be of direct interest to the converter, dyer and finisher.

Althouse Sales Up 10% during First Half

First half 1961 sales of Althouse Chemical Co showed a 10% rise over the previous six months, Felix A Buskey, the company's executive vice president and general manager, revealed at the Company's semi-annual sales meeting held at the Wyomissing Club, Reading, Pa. Althouse Chemical is a division of the Crompton & Knowles Corp.

Mr Buskey attributed the sales gain to Althouse's program of new product development and research which is "geared to industry trends and customer needs."

"Through the fine efforts of research, sales service and production, we have marketed such new products as Cenekol, Lanafast dyes, Nylanthrene Green 2GFL, Nylanthrene Scarlet 2GL, and the newest arrival on the scene, Supernylite Cerise BL.

"Sales should show a continuing upswing during the last half of 1961," he said, "particularly since we plan to unveil a number of new products and new applications of our present line."

Edward A Kent, Althouse's general sales manager, presided at the sessions.

•

Standard Chemical Sales Meeting

New products for the textile industry and new developments in existing products were discussed at the annual sales meeting of Standard Chemical Products, Inc, held recently at the Charlotte, NC, offices and plant.

The company's annual golf tournament was won by John J Bloetjes with a 73. Other award winners were Robert A Jaegars, 74; Edmund Pickup, 82; and Lewis C Greene, 83.

PCTS to Offer Evening School Degree Program

For the first time in its history, the Philadelphia College of Textiles and Science will offer an evening school program leading to the Bachelor of Science degree beginning this September. The College has been offering programs leading to the Bachelor of Science degree in the day school since 1941.

The program will be initiated in three different areas of study, business administration, chemistry, and textile management and marketing.

Entrance requirements will be similar to those required for the day school and all applicants will be required to take tests in English, reading and mathematics. Applicants failing to qualify will be required to take noncredit refresher courses before entering the credit program.

The time required for the completion of the degree program will depend to some extent upon the individual; however, the program is designed so that it may be completed by the average student within seven years. Unusual students may complete the program in less time.

The Philadelphia College of Textiles and Science, founded in 1884, has in the last decade passed through a period of spectacular growth and development. Since 1949, when the campus was moved from Broad & Pine Streets, Philadelphia, to its present site at School House Lane and Henry Avenue in Germantown, it has developed a $5,000,000 campus which includes a classroom and laboratory building, a library, a dormitory housing 150 men, and a student union and auditorium building.

The College is a member of, and accredited by, the Middle States Association of Colleges and Secondary Schools and is a member of the College Entrance Examination Board.

NEW PRODUCTS AND DEVELOPMENTS

Baymal Colloidal Alumina

Baymal colloidal alumina, a white powder consisting of clusters of minute fibrils of boehmite (AlOOH) alumina which was recently announced by DuPont's Industrial and Biochemicals Department, has shown demonstrated effects of interest in the textile field.

Among the properties ascribed to Baymal are its ability to disperse and swell up in water to form a stable colloid; its small fibrillar particles, which are said to lie flat and interlace to form a film, when a colloidal dispersion of Baymal is dried from water onto a surface, this film reportedly remaining stable at high temperatures; its forming of a positive charge when dispersed in water, enabling it to fix itself to negative surfaces. Reportedly hydrophilic and organophilic, Baymal is also said to have a low toxicity. The Company describes it as highly thixotropic; a 4% dispersion, for example, can be changed from a very fluid solution to a viscous sol through a slight change in acidity. A gel thus formed will, according to the Company, remain solid until agitated, when it will turn liquid. On being allowed to stand, the liquid again reportedly becomes a solid gel. Particles of Baymal are extremely small and have high surface area.

Demonstrated effects in the textile field are said to include:

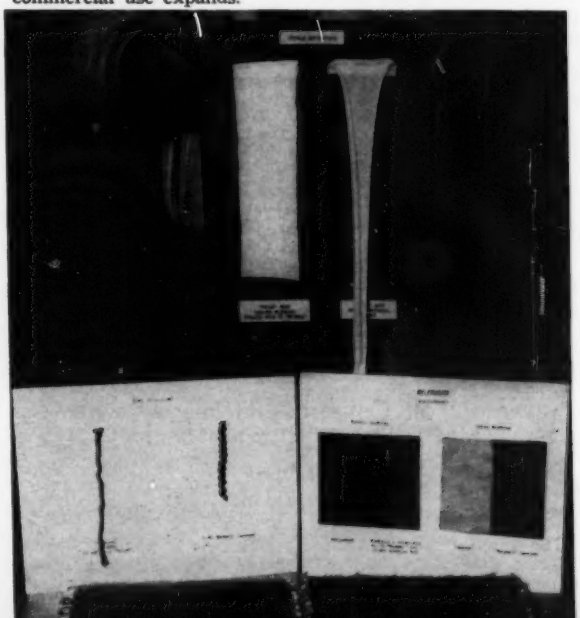
1) Low concentration size or finish for obtaining:
   a) Soil and stain retardancy
   b) Pill retardancy
   c) Fiber frictionizing
   d) Reduced growth of knitwear
   e) Improved hand
   f) Static control
   g) Flame retardancy (at higher concentrations).

2) Anchor coat for anionic hydrophobic and oleophobic agents.

Indicated uses include:

1) Cutting aid for fabric lays
2) Feltproofing of wool or wool blends
3) Frictionizer for cotton and rayon staples
4) Combined emuslifying, dispersing, suspending, and thickening effects for oils, softeners, and other finishing agents.

Baymal is now being produced in developmental quantities at DuPont's Belle, W Va, plant. A limited supply of one-pound samples is available, and larger quantities are being sold at $3.50 per pound. The price is expected by the Company to be reduced substantially as production facilities and commercial use expands.



Reduction of knitwear growth, such as this, is said to be one of several beneficial effects that can be obtained from the application of low concentration sizes and finishes of Baymal colloidal alumina.

Rhoplex HA-16

Excellent durability to laundering and drycleaning, superior stability, high film strength and good abrasion resistance are characteristics ascribed to a new acrylic resin textile binder recently announced by Rohm & Haas Company. The new product, known as Rhoplex HA-16, becomes the fourth member of the Rhoplex HA series of acrylic resin dispersions now offered the textile industry. Other members of the group are Rhoplex HA-4, Rhoplex HA-8, and Rhoplex HA-12.

The resins of the Rhoplex HA series are said to be mutually compatible copolymer dispersions, reportedly offering textile manufacturers a full range of binders from the very soft Rhoplex HA-4 to the very firm Rhoplex HA-16—said to be the firmest, driest resin in the series. Any intermediate degree of firmness reportedly can be readily achieved through various combinations of the four members of this series. Dryness, hand, and film strength are said to be easily varied. This flexibility of formulation reportedly is a valuable aid in the bonding of nonwovens, as well as in the backcoating and finishing of woven textiles.

Rhoplex HA-16, alone or in combination with other resins of the series, is said to be capable of being crosslinked simply by adding a latent acid catalyst—such as Rohm & Haas Catalyst A—and curing at moderate temperatures. The use of oxalic acid is recommended only where simultaneous drying and curing is intended, as resin catalyzed with oxalic acid is said to cure at temperatures below 225°F in a relatively short period.

Rhoplex HA-16 reportedly can be applied by spray as well as saturation techniques in the production of nonwoven fabrics. Development work carried on in cooperation with various textile companies is said to have demonstrated that the new resin is particularly useful in the spray bonding of synthetic fibers used in batting form. Here it reportedly achieves effective control of fiber leakage, even after laundering. In synthetic or cellulosic nonwovens, tack is said to be minimized and loft maintained. Rhoplex is also reported to be useful as a drying agent for decreasing residual tackiness of soft resins, as a hand modifier for cellulosic and synthetic fabrics, and as reinforcing agent for softer acrylates or other resins.

For the backcoating of fabrics, Rhoplex HA-16 is suggested as a means of modifying the hand and tensile strength. It is said to be useful in tufted fabrics where maximum tuft lock is necessary. For soft backings, the addition of a small amount of the new resin reportedly is helpful in minimizing residual tackiness. Where durability to wet processing is required, as in the backing of furniture fabrics which are dyed after coating, the formulation is said to be capable of being crosslinked with an acid catalyst. This necessitates the use of a neutral thickening agent. When wet processing is not a factor, the acid catalyst reportedly can be left out of the formulation and an alkaline thickener used.

Rhoplex HA-16 is proposed as an additive to resin finish formulations to impart hand and strength. When a degree of rigidity is required, this polymer is suggested to serve as the sole finish.

Rhoplex HA-16 is listed at $.23 per pound in bulk; $.25 per pound in truckload drums; and $.255 per pound in less than truckload drums, minimum freight allowed.

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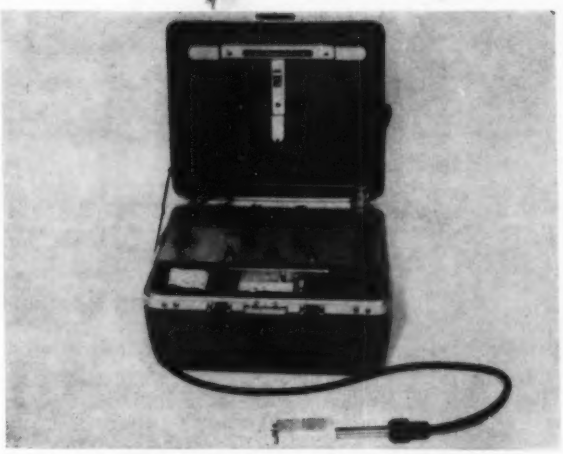
Supernylite Cerise BL

Althouse Chemical Company has announced a new offering, Supernylite Cerise BL, which is said to produce brilliant shades on nylon in the red violet range. This new color is also said to be applicable for similar fashion shades on women's wear woolens and blends.

Supernylite Cerise BL is used with an acid salt or acetic acid and is said to have good fastness to light. Washfastness on nylon reportedly may be greatly increased with an aftertreatment of Cenekol.

The new offering is said to be ideal as a base color for the following 1961 Fall and Winter shades: Violet Glace, Crushed Raspberry, Deep Claret, Crimson Hue and Ruby Glow; also Fuchsia Spark, Fuchsia Bright, Merry Cherry and Ruby Jewel.

In addition it reportedly is applicable to blown glass colors such as Magenta Glace and Venetian Plum. Supernylite Cerise BL is expected to be useful in the formulation of the "Sachet Colors," Sweetpea and Rose Marie, for Spring and Summer 1962.



CSI Custom Tension Recordograph

CSI Reduces Size and Cost of Custom Tension Recordograph

Custom Scientific Instruments, Inc, Kearny, NJ, has reduced the size and cost of its Custom Tension Recordograph. The unit utilizes Sanborn's portable single channel recorder and a transducer sensing head with a range of 0 to 800 gms. The recorder uses transistor to reduce the size of the unit. Shown in the photograph is the recorder and sensing head. In the cover of the recorder is mounted the capacitance system and holders for the sensing head and lead in cable. This unit is designed to measure the amount of tension applied in spinning, winding, warping and other processing.

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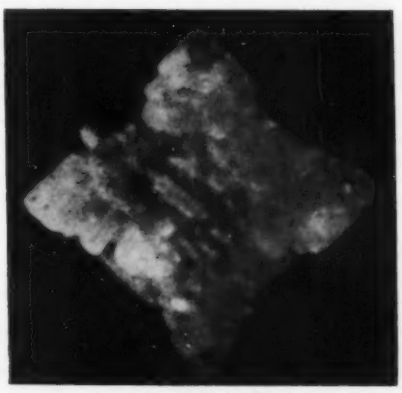
Dendritic Salt

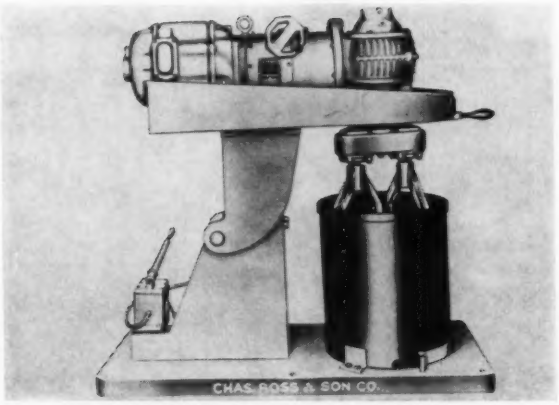
A new type of salt, said to have a unique crystal structure, has been developed by Morton Salt Co, 110 N Wacker Dr, Chicago 6, Ill. Unlike the cubical structure of regular vacuum pan salt or the crystal aggregates of flake-type salt, the basic form of its crystals are branch- or starlike (see picture). The finished product, tradenamed Dendritic Salt, reportedly possesses the fine granulation of vacuum pan salt in addition to the low weight per volume of flake salt. It is said to have a fast dissolving rate, excellent storing qualities, and the ability to serve as an ideal blending agent.

Dendritic Salt is obtained by adding a chemical to the brine as it is evaporated in the vacuum pan. This patented treating process reportedly has the property of causing what would ordinarily be a cube-type crystal to grow faster on the corners, thereby giving the salt its characteristic star shape.

Experimental uses to date reportedly have shown that this salt has performed excellently as a bulking agent.



Dendritic Salt



Double planetary changeable can mixer

Double Planetary Changeable Can Mixer

Charles Ross & Son Company, Inc, 148 Classon Ave, Brooklyn 5, NY, recently introduced a new double planetary changeable can mixer in eight-, 12-, and 20-gallon sizes with dispersion-type stirrers and simplified hydraulic lowering and raising device.

These new mixers are part of the Ross line of double planetary mixers which are available from one-quart to 150-gal sizes. The new machines are said to feature a compact built-in hydraulic control for raising and lowering stirrers from can. With stirrers tilted back out of can for cleaning or removal of can, the floor-mounted mixers reportedly are extremely compact and low in overall height.

Stirrers are of one-piece cast steel or stainless-steel construction and overlap center of can as well as each other. Stirrers are said to rub close to each other and can sides to develop a tremendous compressive and shearing action on the heaviest paste materials. The double planetary mixing action reportedly produces results previously only obtainable in double arm kneading machines.

Standard units are provided with variable-speed motor drive, and vacuum covers or jacketed cans are among the optional features. Full information and literature is available from the manufacturer.

●

Type 2986 Potentiometers

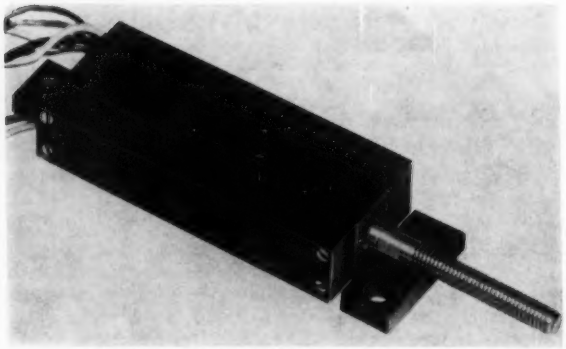
New dual-element rectangular linear motion potentiometer developed for flow controls and instrumentation for the textile and other fields are being offered by the Markite Corp, 155 Waverly Place, New York 14, NY.

The precision units (Type 2986) are said to be particularly applicable in designs with space limitations and high performance, continuous-duty requirements. They reportedly can be utilized as feedback devices for fluid flow rate and pressure controls—to insure manufacturing quality-control standards. Further suggestion has been made for their application as instrument transducers for: 1) fluid metering and liquid level indicators; 2) speed, feed, thickness and process gauging controllers on rotary presses, converters and other manufacturing equipment.

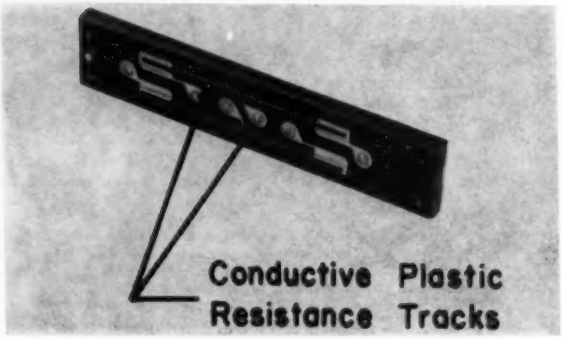
These Markite potentiometers are said to differ from conventional potentiometers in that the resistance element embodies two electrically isolated solid raised tracks of conductive plastic integrally co-molded, together with taps and terminals, to an insulator base of high-temperature phenolic resin of matched thermal expansion coefficient. The conductive plastic tracks reportedly afford extensive resolution and long wear-life. They are said to be provided with a wide range of electrical resistivities, and are reportedly impervious to attack by most common chemicals. The potentiometers are also said to be characterized by low electrical noise and an ability to resist 70g vibration at 5 to 2000 cps as well as shock loading in excess of 100g without malfunction.

Reportedly offering independent linearities of ± 0.5% or better, Type 2986 potentiometers are said to be available with element resistances ranging from 250 ohms to 50K ohms. Shaft stroke is 1.300"; electrical length is 1.000"; dielectric strength: 1500 v rms. Shorter electrical lengths and other element resistances reportedly can be furnished.

The dual-element feature, which permits feeding of output data to two separate and distinct circuits, reportedly



Markite Precision Potentiometer Type 2986



Potentiometer element

obviates the need for two potentiometers. In complex control systems where both resistance tracks are utilized for feedback, output of each track reportedly can be tailored individually for increased system stabilization.

The potentiometer case is fabricated of black anodized aluminum; dimensions: 1.120" × 2.500" × .500". Unit comes with mounting feet (which add 1.400" to case length.) Stainless-steel threaded shaft serves as a means for attachment to acuator linkages. Wire leads are 60" long, reportedly lending themselves to re-dressing to meet special length needs. The potentiometers reportedly can be submerged in oil or other nonconductive fluids.

●

Porelon Ink Rollers for Fabric Impregnation

Fabri-Mark Corp, Box #7045 Roseville Station, Newark 7, NJ, recently announced the development of a complete line of porelon ink rollers for its fabric imprinting equipment. The porelon micro-porous plastic ink supply reportedly eliminates the need for conventional ink transfer systems.

The use of the porelon roller on Fabri-Mark imprinting units is said to be especially adaptable to the use of Fabri-Mark invisible inks for identifying and coding fabric content. Although invisible, these imprints reportedly are readily apparent when viewed under ultraviolet light. Other recent developments of Fabri-Mark Corp for its imprinting units include a full range of colorfast inks for product identification.

●

Aldocryl Resin X-12

A new material derived from acrolein and said to be highly reactive is now being offered in product development quantities by the Industrial Chemicals Division of Shell Chemical Company. Called Aldocryl Resin X-12, it reportedly has a number of promising applications for making better cotton and rayon fabrics.

The new product is said to be useful in the shrinkproofing of rayon and the creaseproofing of cotton. The nonnitrogenous character of Aldocryl Resin X-12 reportedly serves to strengthen cotton or rayon fabrics treated with the new material against the effects of laundry bleaches.

The material is said to have a low molecular weight, to be essentially colorless and to remain stable in storage. It is reportedly furnished as a 50 percent aqueous solution, and is said to be completely water soluble.

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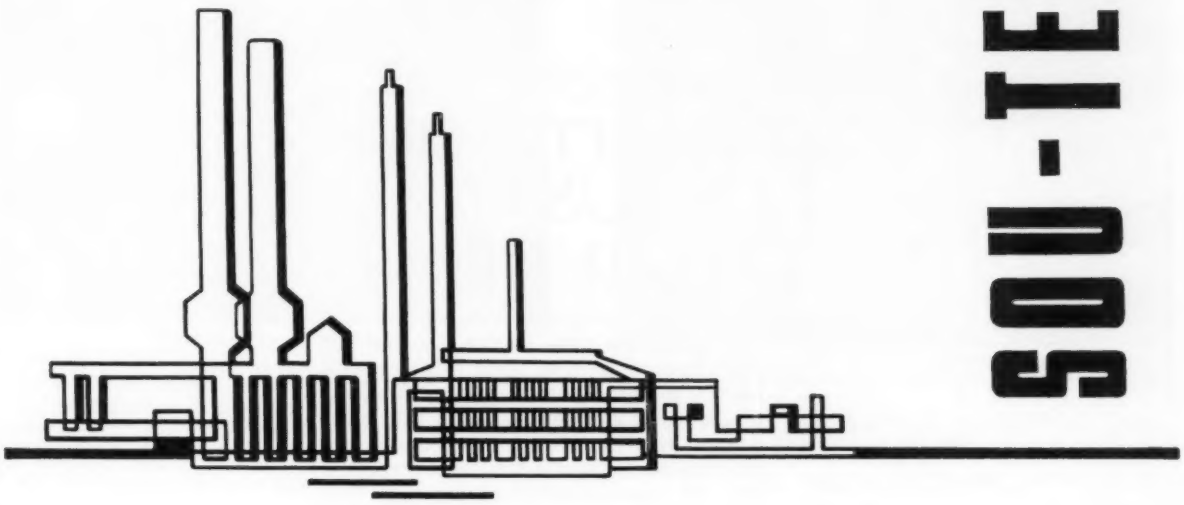

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Has it ever occurred to you that soils of many sorts are stuck on with "juices"? It has — to the dry cleaner. From vests, rompers and summer slip covers, he removes gravy, egg and other stains we'd rather not mention — all with the help of an enzymatic digester. The reason we bring this whole matter up, of course, is that Wallerstein makes RSR, the **standard** dry cleaning digester. In fact, when it comes to making **many** chemical aids for the unromantic but necessary dry cleaning industry, Wallerstein's name is as significant as it is in textiles.

The significance for you? This: constant searching for better digesters has stocked our shelves with commercial, development and experimental enzymes of many types. Purity ranges from AR on down. Could some of these enzymes prove useful in your R&D? Perhaps if you dropped us a line detailing your needs, we might be able to help you work out some "bugs" from your problems. (And remember, please, we make Rapidase® and Serizyme® too.)

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Division of Baxter Laboratories, Inc.
Staten Island 3, N.Y.

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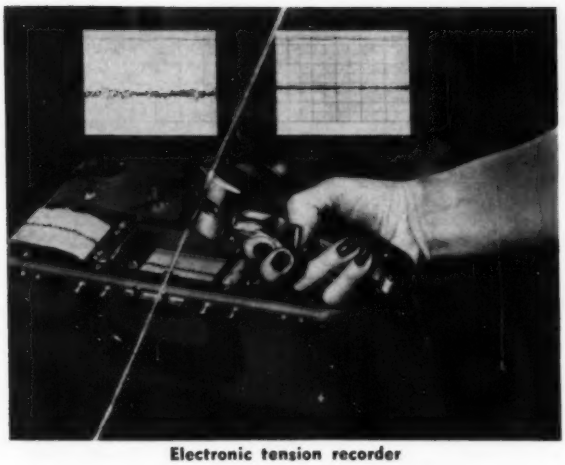


Electronic tension recorder

Electronic Tension Recorder

A new Electronic Tension Recorder to show and record tension and its changes during spinning, twisting and other yarn processes has been added by Tensitron, Inc, PO Box 185, Harvard, Mass, to its line of tension meters.

This instrument reportedly records quickly changing tensions. Not the average tension, but the sudden peaks are considered by the company to be the cause of damage to the yarn. Therefore, quick electric response is viewed as a necessity. Steps can then be taken, the company suggests, to engineer first and standardize tensions thereafter.

The Electronic Tension Recorder reportedly makes possible objective tension measurements during yarn spinning without breaking the roving, by using a micrometer fine-adjustment for the sensing unit. A magnetic base fastens the transducer to the frame.

Different tensioning devices, auxiliary oils, belt slippage, weight of traveler, speed of traverse, rpm, the difference between sintered and steel rings, and other factors that are said to influence tension from yarn ballooning to worn parts reportedly can be demonstrated objectively.

The Electronic Tension Recorder is said to register tension changes not only during the traverse, but reportedly proves also the long-time tension variations when the yarn builds up on a bobbin, pirn or package, or is pulled off same. Tension variations during milliseconds are said to be resolved and changes reportedly shown between different methods of twisting, spinning and winding.

The records (see upper part of the illustration) show tension of yarn, coming from a pirn and from a bobbin to a quill winder. With identical settings, the yarn at the right shows a lower, more uniform tension. The yarn at the left has greater tension *variations*.

The recorder operates at two speeds: at five and 50 millimeters/sec. Thousandths-of-a-second registration is indicated by separate time-markings (above the tension graph).

Tension is sensed by a portable electric tension transducer. The latter is said to have trigger action similar to the standard Saxl trigger tension meters. By pulling the trigger the way a gun is cocked, the three prongs are parted. The filaments are placed between the two outer contacting pins and the tension feeler. Upon release, the yarn is lifted gently against the inner sensing element, producing electric signals, which, after amplification, move the recorder. The latter is said to be of the hot stylus type. Special transducers reportedly extend the use of the Tension Recorder to acid spun yarns and for the heavy tension of tire cords and glass fibers.

●

Kemstrene Amide B

A new Behenamide, primarily in the C_{20}-C_{22} range, intended for improved initial and continuing water repellency in textile formulations, has been announced by HumKo Products, Chemical Division, 501 Allwood Rd, Clifton, NJ.

HumKo is said to have developed stearamides with improved color and color stability for this application. Continuing research in the field reportedly resulted in the development of Kemstrene Amide B (a new Behenamide), which reportedly retains all the advantages of the HumKo stearamide and also is said to provide water-repellent textile formulations with appreciably improved water resistance under the standard AATCC test.

Water-repellent effect is demonstrated on cloth treated with Kemstrene Amide B

●

New SAG 47

A new antifoam fluid for industrial use has been developed by the Silicones Division, Union Carbide Corporation. A more recent version of Union Carbide's SAG 47 antifoam, the new product is said to have greater storage life and stability. Because of its chemical inertness and oxidation resistance, it reportedly is also effective over long periods of time.

Designed especially for quelling foam in non-aqueous and some aqueous systems, the new SAG 47 reportedly can be used to control foam levels while not totally suppressing foam, if so desired. Said to be most effective when added to the system before foaming starts, the new product reportedly can be used at full strength as supplied, in solvent dispersion, or in a blend containing one of the foaming compounds. As evidence of the economy of silicones for antifoam purposes, a starting concentration of 10 to 100 parts of SAG 47 fluid per million parts of foamer is recommended.

●

Valsof PE-45

An entirely new polyethylene emulsion, said to be of exceptionally high concentration, has been developed by Valchem, the chemical division of United Merchants & Manufacturers, Inc, 1407 Broadway, New York 18, NY.

The new product, Valsof PE-45, is now in production at Valchem's Langley, SC, plant.

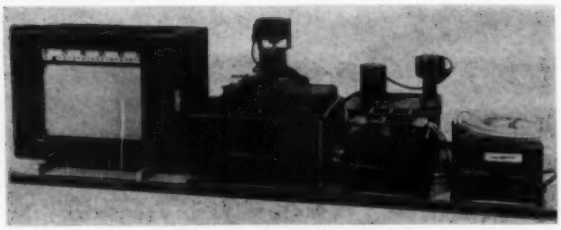
●

Cut Clear LT

A new O/W printing extender for Solitone colors, which is said to permit complete polymerization of the printed goods at temperatures as low as 85°C (185°F) has been announced by Solitone Laboratories, 490 Standish Road, Teaneck, NJ.

The new extender, known as Cut Clear LT, reportedly permits the printer to cure his printed goods on steam cylinders or in a neutral ager without any sacrifice in the alleged dry and wet crockfastness, washfastness or drycleaning resistance of the Solitone line. Unlike other low-temperature curing extenders, Clear LT is said to be completely stable in warm climates and reportedly can be left in color boxes without deterioration. Other features attributed to the new extender are relatively low cost, nontoxic and nonallergenic characteristics and ease of preparation.

Solitone Laboratories developed Cut Clear LT primarily in response to the requirements of its licensees in industrially underdeveloped countries, where the lack of high-temperature curing equipment in printing plants makes the use of conventional pigment systems difficult. Although designed especially for cotton-goods printing, low-temperature curing in nylon and other synthetic printed goods is often considered desirable, and the relatively low cost attributed to the new extender suggests an economical means of achieving this result.



Differential AutoAnalyzer

Differential AutoAnalyzer

A new differential AutoAnalyzer for continuous chemical analysis, with automatic blank or interference compensation, that is said to be capable of detecting trace materials down to parts per billion with an accuracy of 1%, has been announced by Technicon Controls, Inc, Research Park, Chauncey, NY.

Reportedly providing dependable analysis with exact reproducibility, the Technicon AutoAnalyzer is said to automate all steps of a chemical analysis now performed manually and integrate them into a continuous flow system. It is claimed that the instrument system automatically measures, mixes, purifies, processes, compares and records, and runs 20, 40 or 60 complete tests without human supervision.

A differential colorimeter is said to cancel out automatically high blanks or colored samples which interfere with an analytical reading. A two-position switch reportedly permits use as either a differential colorimeter or two separate colorimeters.

By feeding an untreated sample (reference) to one flow cell, and the sample to be analyzed to another, the dual colorimeter is said to provide a reading which is the true value equivalent of the treated minus the untreated sample. Operated as two individual dual-beam colorimeters in the same housing, the unit reportedly permits each channel to operate independently of the other. Each is said to measure the output ratio of sample vs reference recorded in terms of optical density.

Selenium photocells reportedly are used for 400 to 650 mμ wavelength range. Hermetically sealed pairs, they are said to be matched for sensitivity, special response and temperature coefficient. For wavelengths between 600 and 950 mμ, silicon photocells are employed.

AutoAnalyzers are said to be available for single or multiple component determinations, for laboratory or plant use. Among the materials analyzed by the Technicon system are cyanides, silica, phosphates, iron, chloride, sugars, aluminum, sulfates, copper, etc.

In the plant, hooked up to process or waste stream, liquid or gas, it reportedly will continuously monitor and record the concentration level of one or a number of materials. Acting as a transducer in a control loop, AutoAnalyzer is said to be capable of monitoring the steady-state control devices through on-stream continuous measurement.

The self-cleansing system is said to be of modular design, and thus to afford ease of maintenance.

●

Emerstats 7450 and 7451

Two new antistatic lubricants for woolens, worsteds, and synthetics have been introduced by the Organic Chemicals Division of Emery Industries, Inc. Emerstat 7450 features fiber-to-fiber lubrication, while Emerstat 7451 features fiber-to-fiber cohesiveness. During their development, they were known as Emery 3309-S and Emery 3310-S, respectively.

Both products are said to be nonionic lubricants possessing a very high degree of antistatic properties and excellent fiber-to-metal lubrication. They are said to be fluid enough to be applied neat, or may be diluted to form thinner solutions.

It is claimed that the high antistatic action of the Emerstat lubricants makes them effective in such high-speed operations as Turbo stapler or Pacific converter types of operations, tow-to-top operations, and synthetic fiber processing on the cotton system. They also are said to offer advantages in worsted pin-drafting operations where static is severe. Emerstat 7451 reportedly is effective in processing slippery fibers and in processing synthetic fibers for carpet yarn.

Technical Bulletin No. 423, entitled "Emerstat 7450, 7451 Lubricants," is available on request from Emery Industries, Inc, Dept 5, Carew Tower, Cincinnati 2, O.

Liq-Dull 63

High degrees of delustering and flexibility are said to be the prime properties of a newly developed finish now available for textile industry use by the W F Fancourt Company, 516 S Delaware Ave, Philadelphia 47, Pa.

Called Liq-Dull 63, the new finishing agent reportedly provides an unusual leveling ability along with delustering and is said to give flexible body with an even drape.

It reportedly is available for woven or knit fabrics, natural or synthetic fibers and is said to be capable of being applied to both bleached and dyed goods.

Liq-Dull is said to be compatible with all Fancourt finishes. When used in conjunction with Nydull or Nydull LB, it is said to enable these finishes to penetrate the tightest folded goods.

●

Palanthrene Brilliant Green 5G Powder Fine Conc for Dyeing; Basosoft SF

Palanthrene Brilliant Green 5G, a supplement to its existing range of the yellowish Palanthrene brilliant green dyestuffs, has been developed by Badische Anilin-& Soda-Fabrik AG, Ludwigshafen am Rhein, West Germany. The new product is said to exhibit the following advantages over the older Palanthrene Brilliant Green 4G: 1) *higher lightfastness*, particularly in pale shades; 2) *better leveling*, considered particularly useful in package dyeing; 3) *good constancy of shade* when dyeing at varying temperatures.

Palanthrene Brilliant Green 5G is said to be fast to washing, soda boiling, chlorine and mercerizing. It reportedly can be applied in both piece and package dyeing by all methods commonly employed today. It is said to be suitable for vegetable textile fibers in all stages of processing. Palanthrene Brilliant Green 5G reportedly dyes almost solid shades on cotton-rayon mixed fabrics. It is recommended by BASF for typical laundry goods and colored bleach articles, and also for curtains and hangings.

Basosoft SF, another new product placed on the market by BASF, is a softening agent said to be highly effiicient for textiles of all types. The product is suggested as being particularly suitable for the finishing of synthetic fibers, and is said to produce excellent softening effects even when used in very small quantities. Basosoft SF is recommended by BASF for use as a spin finish for synthetic fibers in view of its reportedly good resistance to heat setting, a property which is said to ensure maintenance of the hand and the antistatic effect. Basosoft SF reportedly dissolves readily when hot water (90°C) is poured over the product and the temperature raised to the boil for a short time. In weakly acid medium, the product is said to be resistant to hard water up to 40° German Hardness (50° English Hardness). Basosoft SF reportedly can be combined with a wide variety of finishing agents, and the potential fields of application are said to be almost unlimited.

●

Bancroft Licensed to Apply Scotchgard to Decorative Fabrics

A "new dimension in easy-care decorative fabrics" is the claim put forth by Minnesota Mining and Manufacturing Co with the licensing of Joseph Bancroft & Sons Co to apply Scotchgard stain repeller to decorative fabrics.

The addition of Scotchgard repeller to Everglaze fabrics is said to lend to the fabrics repellency to oil-borne and water-borne stains (qualities described by 3M as inherent to the repeller) in conjunction with the automatic washable, little or "no-ironing" features considered by Bancroft as characteristic of the Everglaze Minicare fabrics finished at the Wilmington plant. The new fabrics are said to be subject to rigid quality control standards of both Bancroft and 3M.

●

Unithane 200

Unithane 200, a urethane-based system for bonding foam to textiles, has been introduced by Thiokol Chemical Corp, 780 North Clinton Ave, Trenton, NJ.

Described as a stable, one-package urethane-based adhesive, Unithane 200 is activated on the application of heat. It is said to provide a high-strength bond.

Advantages claimed are its ease of handling, high degree of initial tack, excellent hand, and resistance to drycleaning solvents. Other features claimed are: no strike through of the adhesive, no puckering or rippling of foam-lined fabrics, and no delamination after washing or cleaning.

DETERGENTS

SEYCO-TERGE A is by far the most effective detergent for textile purposes. A flake based on alkylarylsulfonates, blended with phosphates, soil-suspending agents, and a synergistic additive. (No dusting! No sneezing!) Minimum wet-back on water-repellent fabrics.

SEYCO-TERGE LT-7 will scour off your prints and stripes with no bleeding back. Whites stay *bright* white.

SEYCO-TERGE NI we recommend especially for removal of greasy and oily soil and processing lubricants. Fine for wool and synthetics.

SEYCO-TERGE NI EXTRA. Use with solvents for cleaning of blankets, back-greys, and similar hard-to-clean jobs. Unexcelled for these tough ones.

Warp Sizing: *Softeners, Binders, Penetrants, Ty-In Penetrants, Shuttle Dressing, Waxes.*

Niagara Twist-Setter: *Yarn Conditioning Penetrants.*

Seyco Warp Lubricator.

Wet Processing Chemicals and Auxiliaries: *Dye Assistants, Penetrants, Rewetting Agents, Sanforized Fabric Oils, Detergents, Scouring Agents, Softeners*

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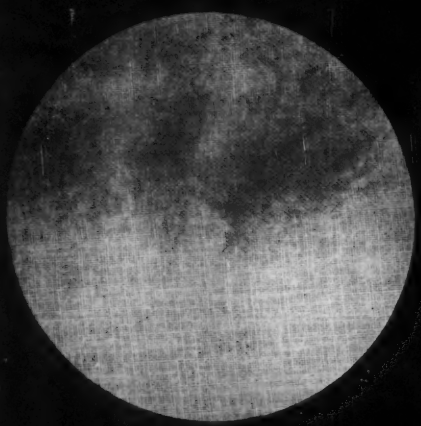

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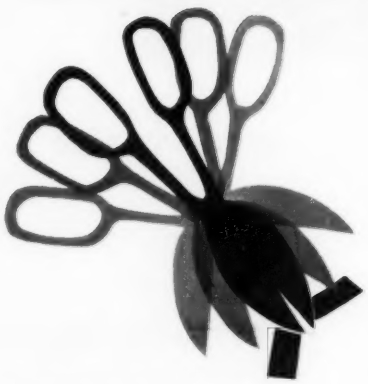

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PERSONALITIES IN THE NEWS

Barnes

Sarracino

McCamy

Newman

Harvey

FMC Corp has named *Carl E Barnes* its new vice president for research. Dr Barnes' primary responsibility will be direction of the research, development, and patent activities of FMC's chemical divisions, and he will make his headquarters at the administrative offices of those divisions in New York.

The new FMC vice president has been a research executive of Minnesota Mining and Manufacturing Company for the past eight years, most recently as vice president for research. Prior to his association with 3M, he held research positions with Arnold Hoffman & Co, Inc, and with General Aniline and Film Corp.

●

Metro-Atlantic, Inc has named *Gerald J Sarracino* general manager of its Southern Division, succeeding the late *D J Papini*.

Mr Sarracino has been associated with Metro-Atlantic since 1953.

●

The appointment of *Graham M Richardson*, Textile Fibers Department, E I duPont de Nemours & Co, Inc, as chairman of the annual conference of the American Association for Textile Technology has been announced by Kurt J Winter, president of the Association. The 1962 conference, scheduled for February 7th, will be held at the Hotel Commodore, New York.

●

The United Piece Dye Works has announced the appointment of *Albert V Morrell* as plant manager of its York, Pa, mill, effective July 31. Mr Morrell was formerly manager, Fabrics Division of The Hellwig Dyeing Corp. He was associated with Hellwig for 27 years.

●

The following have been elected to Fellows of The Society of Dyers and Colourists: *Raymond Thornton*, technical service manager, Arnold Hoffman & Co, Inc; *Ernest Eric Bowker*, technical director, Industrial Dyestuffs Ltd; *Leonard Cooper*, buyer and company consultant, The United Africa Co Ltd; *Clifford Duckworth*, section director (production), The Bradford Dyers' Association Ltd; *Denis Ronald Lemin*, dyestuffs technician, Imperial Chemical Industries Ltd; and *Lascelles Morton Wood*, managing director, Norman Wood & Son Ltd.

●

Latest scholarship winners to be announced by Clemson College School of Textiles are *John W Mathis*, senior majoring in textile management, winner of a $500 Chemstrand Scholarship; *Lloyd E Foster*, senior majoring in textile management, $400 Keever Starch Scholarship; *Jerry L Witt*, sophomore majoring in textile management, recipient of the $300 Ben and Kitty Gossett Scholarship; *Charles C Hagood*, senior majoring in textile science, winner of a $500 Owens-Corning Fiberglas Scholarship; and *Edward T Samulski* and *Marshall White Jr*, entering freshman, who will study textile designing and textile chemistry, respectively, winners of $2400 four-year Leon Lowenstein Foundation Scholarships.

●

Latest scholarship winners at North Carolina State College's School of Textiles are *Charles Eugene Fox Jr*, junior recipient of the Burlington Industries Foundation Scholarship ($500); *John Alex Bynum*, sophomore recipient of a $300 scholarship from the Carolina Yarn Association; and *Henry Walter Somers Jr*, freshman textile chemistry major, recipient of the first John E Hamilton Scholarship ($500).

Robert J McCamy has been named vice president in charge of all finished piece goods production for the Pepperell Manufacturing Company. He was formerly assistant general manager of the Lindale Division.

For a time he headed the Pepperell dyeing department laboratory, overseer in 1938, and advanced to assistant superintendent in 1942. He was promoted to superintendent on January 1, 1946, and assistant general manager on September 16, 1955.

●

Robert B Newman has been named vice president & director of sales of Vulcan Containers, Inc, Bellwood, Ill. Mr Newman joined Vulcan-Associated Container Companies, Inc in 1959 and has served as assistant to the president, *George D Zuck*.

George R Zies continues as sales manager of Vulcan-Bellwood and will now devote his full time. During the past several months, he has been on a management development program.

Vulcan Containers operates a steel pail and ink can manufacturing plant in Bellwood.

●

The creation of an autonomous Pacific sales territory for the Corn Refining Division of Penick & Ford, Ltd, Inc has been announced. The Pacific area had formerly been a district of the Western territory.

Harold A Harvey has been appointed sales manager. Since 1949 he has been district sales manager for the Pacific Coast.

●

W Rollin Keen has been named a vice president of Collins & Aikman and director of corporate product development.

Mr Keen joined Collins & Aikman 36 years ago as a chemist. His work with the company has always been in the fields of research and development, and he was appointed director of research in 1949.

●

In line with a program to complete national representation for its line of portable and stationary open/closed turbine mixers, Barrington Industries, Inc, Providence, RI, has appointed *Ivan W Benson*, of Decatur, Ga, to cover a territory including the Carolinas, Georgia, Alabama, eastern Tennessee, and northern Florida.

●

The promotion of *Arthur N Green* to group leader in the industrial products group of its chemical product development department, and the appointment of two new staff members have been announced by Atlas Chemical Industries, Inc. Those joining the staff are *Benjamin F Fay*, industrial products group, and *Eric M Golden*, the Darco (activated carbon) group.

Mr Green became industry assistant in the industrial products groups of the chemicals sales department late in 1959.

Mr Fay joined Atlas from the Gulf Research and Development Co. Previously he was with Gulf Oil Corp.

Mr Golden is a recent graduate of the Philadelphia College of Textiles and Science.

V B Chipalkatti, director, Shri Ram Institute of Industrial Research, Delhi, India, is planning to visit the United States this fall with the object of keeping himself in touch with the progress of scientific and industrial research in this country and visiting a few research and other institutions.

Dr Chipalkatti, who has had 10 years of industrial experience as an assistant dyeing master, an assistant development officer, and chief research and coordination officer and 10 years applied research experience in the fields of textile chemistry, cellulose chemistry and industrial organic chemistry, has been responsible for initiating important work in connection with the application of fluid beds to textiles. He has many patents and publications to his credit, has developed a series of resins/crosslinking agents for the treatment of cellulosic fabrics, and is responsible for a new patentable process for synthesis of carboxymethylcellulose. Based on his research, a factory to produce CMC has been started in India.

Dr Chipalkatti has built a small school of research in the following fields: crosslinking of cellulose, application of fluid-bed techniques to cellulose textiles, rotproofing of cellulosic materials, anticrease and antishrink finishes for cotton and rayon, improvements in viscose rayon spinning, etc.

American Cyanamid Company has announced a number of new appointments. Included is that of *Jason W Salsbury* as director of fibers research for the Fibers Division, succeeding *Richard Lindenfelser*, who was recently named technical director of Cyanamid's Wasco Products Dept. Dr Salsbury will supervise Cyanamid's research on fibers, centered in the company's research laboratories in Stamford, Conn. He will report to *Nat H Marsh*, technical director of the division.

Since 1958, Dr Salsbury has been manager of the technical department at Cyanamid's acrylic fiber plant near Pensacola, Fla.

Richard J Franz has been appointed to succeed Dr Salsbury as manager of the technical department at Cyanamid's Santa Rosa Plant. Mr Franz had been manager of the plant's engineering department.

At the same time, other appointments to plant posts were also announced. *Richard W Leins*, currently manager of the plant's production department, has been named manager of the engineering department, succeeding Mr Franz; and *John J Fitzgerald* has been appointed manager of the production department, succeeding Mr Leins. Mr Fitzgerald is now manager of operations at the company's Fortier Plant, near New Orleans.

TECHNICAL LITERATURE

(Literature is available from sources listed in italics)

ALDEHYDES——*Union Carbide Chemicals Co, 270 Park Ave, New York 17, NY*——This 45-page booklet contains data on acetaldehyde, paraldehyde, propionaldehyde, butyraldehyde, isobutyraldehyde, acetaldol, acrolein, acrolein dimer, methacrolein, crotonaldehyde, glyoxal, pyruvic aldehyde, gultaraldehyde, 2-hydroxyadipaldehyde.

Included is information on physical properties; constant-boiling mixtures; specification limits; test methods, storage, handling, and shipping; toxicological properties; and selected literature references.

●

COMMERCIAL CARE OF FIBER GLASS FABRICS——*Pittsburgh Plate Glass Co, Fiber Glass Merchandising Office, 579 Fifth Ave, New York 17, NY*——Two-part report, written by a consultant to the textile industry, Charles Simon, states that many of the laundering procedures used for fiber glass drapery fabrics by professional laundering establishments and building maintenance personnel are both uneconomical and in many cases extremely harmful to the fabrics. The study and report, which recommends proper laundering procedures for these materials, were stimulated by the growing volume use of fiber glass materials for large commercial drapery applications and the resultant need for economical and effective laundering methods. The author's findings were revealed after a year's evaluation study of existing laundering practices conducted in cooperation with the American Institute of Laundering.

Since many commercial drapery applications are heavy in construction, some ranging in size from 30 to 40 feet in depth and 150 feet in width, they cannot be laundered by hand. Mr Simon's report provides a simplified guide for washing fiber glass fabrics commercially with available equipment or by using the new tank method which he recommends for larger-size draperies.

●

EMERSTATS——*Organic Chemicals Division, Emery Industries, Inc, Dept 5, Carew Tower, Cincinnati 2, O*——Technical Bulletin No. 423 describes the company's newly introduced antistatic lubricants, Emerstat 7450 (high fiber-to-fiber lubrication) and Emerstat 7451 (featuring fiber-to-fiber cohesiveness). The booklet lists product properties, comparative evaluations, and suggested methods of application.

●

HOSIERY QUALITY CONTROL——*Hatch Textile Research, Inc, 25 E 26th St, New York 10, NY*——Laboratory Bulletin No. 12 briefly outlines HTR's new nylon hosiery quality control service.

HOW TO IDENTIFY ORGANIC COMPOUNDS THROUGH INFRA-RED SPECTROSCOPY——*The Sadtler Research Laboratories, 1517 Vine St, Philadelphia 2, Pa*——Four-page brochure outlines how organic compounds may be identified through infra-red spectrophotometry in one of three ways: 1) recognition at sight, 2) recognition by sampling, or 3) recognition by comparison.

Brochure discusses Sadtler standard infra-red spectra available as individual cards or loose leaf volumes and Sadtler spectra indices.

●

PETROMIX FOR THE MANUFACTURE OF SOLUBLE OILS AND EMULSIFYING SOLVENTS——*Sonneborn Chemical and Refining Corp, 300 Park Ave South, New York 10, NY*——This seven-page industrial research bulletin reviews a line of emulsifiers, tradenamed Petromix, with applications in the manufacture of soluble textile oils. Topics include blending instructions for a variety of formulations.

●

PROCESSING CHEMICALS——*Literature Dept, Nopco Chemical Co, 60 Park Pl, Newark 1, NJ*——Four-page bulletin No. ISP-50 provides a condensed listing of the more important processing chemicals available from Nopco. Including broad general categories of the products, it gives the chemicals and types available in each, also supplying descriptions of chemical class and applications.

Categories included are surfactants, hydrosulfites and sulfoxylates, defoamers, resin and wax emulsions, water-soluble lubricants, water-soluble resins, softeners, and gas-fading inhibitors. Also listed are enzymes, metallic soaps, stabilizers, and inorganic compounds.

●

SILICONE FLUIDS——*General Electric Silicone Products Dept, Waterford, NY*——S-9, a 20-page, two-color technical reference, describes the broad range of major silicone fluids. Differentiating between the available grades of silicone fluids according to viscosity, the publication classifies them on the basis of physical properties. An index permits the user to select a particular fluid on the basis of properties required in his application. Special features of the reference are a physical data summary chart, which permits identification of major grades of materials available, and a silicone fluid selector, in which available silicone fluid grades are identified by major application areas.

The publication is liberally illustrated with photos, curves and tables, providing application ideas as well as pertinent data.

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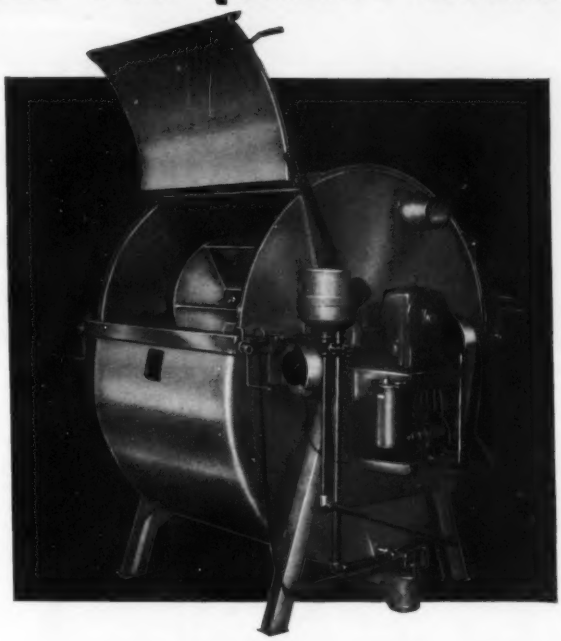

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Advertisements in this section are restricted to HELP WANTED — POSITION WANTED — EQUIPMENT wanted or for sale. Rates, effective February 1, 1951; one-time, $14.00 per column inch; 13 or more times, $12.00 per column inch; Position Wanted, $4.00 per column inch. Figure 38 average words per column inch. Publisher reserves the right to reject or discontinue any classified advertisement. Replies should be addressed: Box Number ..... c/o American Dyestuff Reporter, 44 East 23rd Street, New York 10, N. Y.

• SERVICES •

ABSTRACTING SERVICES—Abstracting and digesting of foreign patents and periodicals. Literature review and special reports in dyestuff and cellulose chemistry. PAUL WENGRAF, 88-36 ELMHURST AVENUE, ELMHURST 73, NEW YORK.

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POSITION AVAILABLE: SALES TECHNICAL. Must have experience in dyeing and finishing of man-made and natural fibers. Territory to include South Carolina and Georgia. Send complete resume. Write Box No. 199

WANTED: DYE HOUSE AND LABORATORY SUPERVISOR—preferably experienced in Pile Fabric Dyeing. Our own employees are aware of this advertisement. Write Box No. 206

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WANTED: TEXTILE CHEMIST for synthetic dyeing and finishing plant. Minimum of 5 years plant experience. Must be able to supervise fully equipped laboratory and have the initiative to assist dyer and finisher to solve plant problems. Send resume. Replies confidential. Write Box No. 208

WANTED: CHIEF CHEMIST—DYEING, FINISHING AND QUALITY CONTROL to direct laboratory and plant liaison. Background in quality control statistics advantageous. Salary commensurate with experience. Write Box No. 209

WANTED: TEXTILE CHEMIST—Experienced man for research on textile lubricants, finishes, and laundry chemicals. Submit resume and salary requirements to Personnel Department, MASURY-YOUNG COMPANY, 76 Roland Street, Boston 29, Massachusetts.

• OPPORTUNITIES AVAILABLE •

WANTED: RUBBER CHEMIST—Large Southern firm has an immediate opening for a man with a B.S. Degree in Chemistry and five to seven years experience in the compounding of latices for adhesion to rubber. Position involves work with production, customer contacts, development of new treatment for textiles, and other similar assignments. Excellent opportunity. Write stating age, qualifications and salary requirements. Replies confidential. Write Box No. 213

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POSITION WANTED: GRADUATE TEXTILE CHEMIST desires a stimulating and challenging position in sales service and/or application research. Seven years experience in the use of textile specialties and dyestuffs in the laboratory and in the field. New York, New Jersey location preferred. Would consider a sales position. Write Box No. 198

POSITION WANTED: P. T. I. GRADUATE—9 years diversified experience laboratory and quality control work, U. S. and abroad. Seeks challenging position U. S. firm, possibly foreign technical service. Three foreign languages fluently spoken. Write Box No. 201

POSITION WANTED: TEXTILE COLORIST—Age 28, 9 years experience in application laboratories of several large dyestuff manufacturers. Knowledge in printing and dyeing of various groups of dyestuffs. Will relocate. Write Box No. 203

POSITION WANTED: CHEMICAL ENGINEER—8 years experience in most phases of textile chemical finishing, including 4 years of physical and chemical development work of deep pile fabrics desires overseas position. Will also consider interesting domestic challenge. Write Box No. 204

• PERSONNEL AVAILABLE •

POSITION WANTED: CHEMIST, M.S. Polymer Chem.; B.S. Textile Chemistry, over 10 years of experience varying from Group Leader to Supervisor. Presently employed. Seeks equivalent or more responsible position in New York Metropolitan area. Write Box No. 210

POSITION WANTED: TEXTILE TESTING—CHEMIST, M.S. degree. 12 years experience in the textile industry. Experienced in testing from fiber to garment. Desirous of interesting and challenging position. Write Box No. 211

POSITION WANTED: CHEMICAL ENGINEER—Over 20 years experience as Chemist and trouble shooter in various piece goods dyehouses is available. Familiar with all kinds of fibres in dyeing direct vat and naphtol. Desire opportunity as supervisor or Chemist. Write Box No. 212

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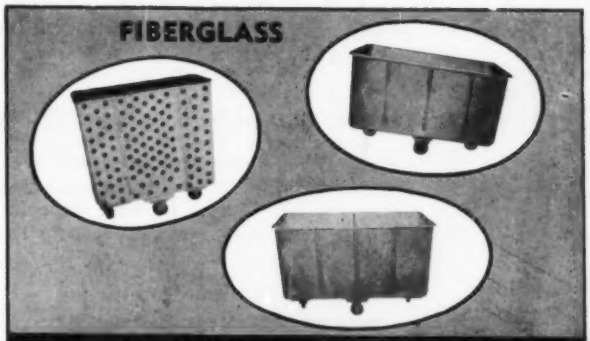

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Because of the nearness to Canada, both the AATCC and the CATCC are planning many features which will contribute to a very interesting and instructive convention.

American Dyestuff Reporter—official publication of the Proceedings of the AATCC—will be publishing the official issue for this important Convention, on September 18, 1961 to give Association members plenty of time to study complete program details and make their Convention Plans.

American Dyestuff Reporter's AATCC Convention Issue will contain details on all the many Convention events and technical sessions, plus special stories on awards and contests, and interesting background and historical data, and complete Convention program.

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- *inactivates stripped dye*
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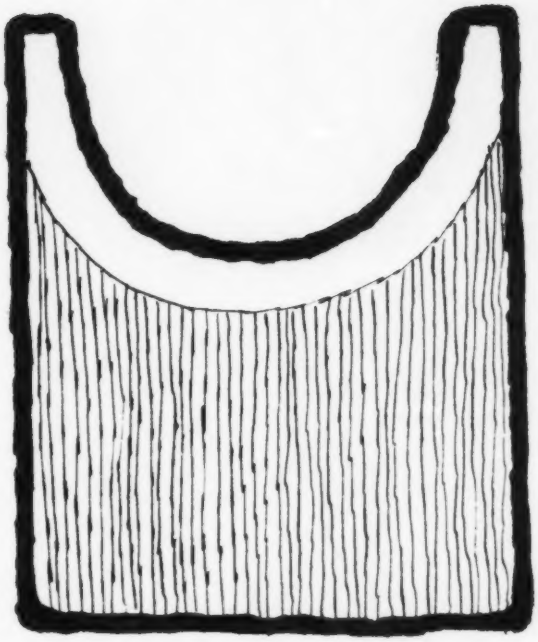

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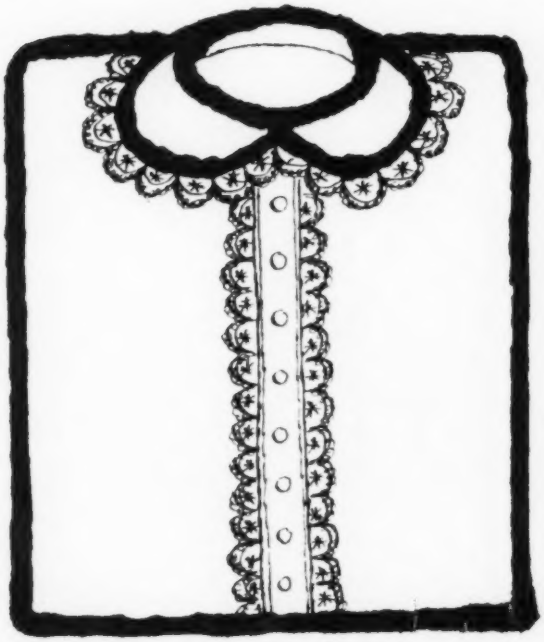

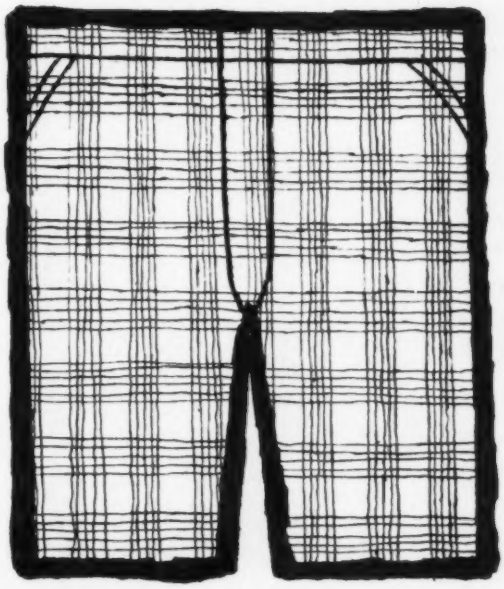

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